openreach

SIN 261

Issue 5.9
February 2025

Suppliers' Information Note

For The Openreach Network

BT ISDN 2e and ISDN 30e Services using full ETSI Call Control

SERVICE DESCRIPTION & FULL-SERVICE WITHDRAWAL NOTIFICATION

Each SIN is the copyright of British Telecommunications plc. Reproduction of the SIN is permitted only in its entirety, to disseminate information on the Openreach Network within your organisation. You must not edit or amend any SIN or reproduce extracts. You must not remove Openreach trade marks, notices, headings or copyright markings.

This document does not form a part of any contract with Openreach customers or suppliers.

Users of this document should not rely solely on the information in this document, but should carry out their own tests to satisfy themselves that terminal equipment will work with the Openreach network.

BT reserves the right to amend or replace any or all of the information in this document.

BT shall have no liability in contract, tort or otherwise for any loss or damage, howsoever arising from use of, or reliance upon, the information in this document by any person.

Due to technological limitations a very small percentage of customer interfaces may not comply with some of the individual characteristics which may be defined in this document.

Publication of this Suppliers' Information Note does not give or imply any licence to any intellectual property rights belonging to British Telecommunications plc or others. It is your sole responsibility to obtain any licences, permissions or consents which may be necessary if you choose to act on the information supplied in the SIN.

This SIN is available in Portable Document Format (pdf) fromhttps://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do

Enquiries relating to this document should be directed to orsinsfa@openreach.co.uk

Openreach logo are trademarks of British Telecommunications plc. © British Telecommunications plc 2025.
Openreach Limited, Registered office: 6 Gracechurch Street, London EC3V 0AT.Registered in England and Wales no. 10690039

CONTENTS

FOREWORD 4

1. GENERAL 6

2. SERVICE AVAILABILITY 7

3. SERVICE DESCRIPTION 10

4. SERVICE INTERWORKING 11

5. FUTURE DEVELOPMENTS 11

6. CONTACT POINTS 11

7. ABBREVIATIONS 11

8. REFERENCES 14

10. HISTORY 20

ANNEX A - BT ISDN 2E AND ISDN 30E - SERVICE FACILITIES 21

A.1 INTRODUCTION 21
A.2 BASIC SERVICES 21
A.3 USER CONFIGURATIONS DEFINED IN INTERNATIONAL STANDARDS 27
A.4 BT CONFIGURATION FOR ISDN 2E SERVICE 28
A.5 BT CONFIGURATION FOR ISDN 30E SERVICE 31
A.6 DIRECTORY NUMBER ALLOCATION 32
A.7 DIGITAL CALLING FEATURES 33
A.7.1 ANONYMOUS CALL REJECTION (ACR) 37
A.7.2 CALL DEFLECTION (CD) 37
A.7.3 CALL FORWARDING ON BUSY (CFB) 37
A.7.4 CALL FORWARDING ON NO REPLY (CFNR) 39
A.7.5 CALL FORWARDING UNCONDITIONAL (CFU) 40
A.7.6 CALL HOLD (HOLD) 41
A.7.7 CALL WAITING (CW) 42
A.7.8 CALLING LINE IDENTIFICATION PRESENTATION (CLIP) 42
  A.7.8.1 Interworking with ISDN Services supported on the limited ETSI call control network platform 43
  A.7.8.2 Interworking with PSTN CDS™ (Caller Display Services) 44
A.7.9 CALLING LINE IDENTIFICATION RESTRICTION (CLIR) 44
A.7.10 CONNECTED LINE IDENTIFICATION PRESENTATION (COLP) 45
A.7.11 CONNECTED LINE IDENTIFICATION RESTRICTION (COLR) 45
A.7.12 DIRECT DIALLING IN (DDI) 46
A.7.13 INCOMING CALL BARRING (ICB-F) 47
A.7.14 MALICIOUS CALL IDENTIFICATION (MCID) 47
A.7.15 MULTIPLE SUBSCRIBER NUMBER (MSN) 48
A.7.16 OUTGOING CALL BARRING (OCB-F) 49
A.7.17 PRESENTATION NUMBER (PN) 50
  A.7.17.1 Interworking with PSTN CDS™ (Caller Display Services) 50
A.7.18 SUBADDRESSING (SUB) 50
  A.7.18.1 Interworking with ISDN Services supported on the limited ETSI call control network platform 51

A.7.19 TERMINAL PORTABILITY (TP) 52
A.7.20 TRUNK/LINE HUNTING 52

ANNEX B - RESTRICTIONS APPLICABLE TO BT ISDN 2 AND ISDN 30 (I.421) SERVICES SUPPORTED ON THE *LIMITED ETSI CALL CONTROL* NETWORK PLATFORM 54

B.1 INTRODUCTION 54
B.2 SUMMARY OF PRINCIPAL RESTRICTIONS 54

ANNEX C - ADDITIONAL TERMINAL DESIGN GUIDE INFORMATION 56

C.1 INTRODUCTION 56
C.2 CAUSE DEFINITIONS 56
C.3 BYPASS NUMBERS 56
C.4 ACCESS TO INTELLIGENT NETWORK (IN) SERVICES 56
C.5 TRAFFIC/CHANNEL MANAGEMENT 57
C.6 MULTIPLE SIMULTANEOUS CALL ESTABLISHMENT/AUTOMATIC CALL GENERATION 57
C.7 ISDN CONNECTIONS USING SATELLITE LINKS 57
C.8 ISDN 30E - SETTING OF SA BITS IN LAYER 1 58
C.9 CODING OF FACILITY INFORMATION ELEMENT 59
C.10 CALL HOLD AND TERMINAL PORTABILITY 59
C.11 CPE CONFIGURATION AFFECTING CALL CHARGES 59
C.11.1 LONG DURATION CALLS 59
C.11.2 SHORT DURATION CALLS (AUTOMATIC CALL GENERATION) 60
C.12 CPE COMPLIANCE WITH INTERNATIONAL STANDARDS 60
C.13 CALLED PARTY NUMBER INFORMATION FIELD 61
C.14 PROGRESS INDICATOR INFORMATION ELEMENT 'LOCATION' CODE POINT '03' (TRANSIT NETWORK) 62
C.15 SUB-EQUIPPED CIRCUITS 63
C.16 VOICE CALLS - NETWORK TONES & ANNOUNCEMENTS 63
C.17 FORWARDED CALLS CFU, CFNR, CFB & CD - RECEIPT OF ADDITIONAL LAYER 3 MESSAGES AND INFORMATION ELEMENTS 63
C.18 TELEPHONY 7 KHZ AND VIDEOTELEPHONY 63

ANNEX D - DIFFERENCES COMPARED TO PREVIOUS ISSUE OF SIN 261 65

FOREWORD

This SIN describes the BT ISDN 2e and ISDN 30e ETSI services. SIN 312 provides an overview of all BT ISDN services and lists the relevant SIN(s) providing the detailed service description. In order to help ensure maximum interoperability between terminal equipment and the Openreach service, considerable technical detail has been included in this document. The attention of terminal manufacturers is drawn to the following points:

- The basis for the technical specification is the *relevant* ETSI standards. A number of ETSI ISDN standards have been amended or up-issued and it is important to ensure that the correct version of the standard is used. This document lists the standards and their issue number relevant to the BT service. Examples of where ensuring that the correct issue of the standard used is important are:
  - ⇒ Where a STATUS message is sent as part of the Layer 3 signalling error handling procedures, ETS 300 102-1 [see footnote to ref. 12] (prior to its amendment) specified that the call state to be included was the state in which the errored message was received. The ETS 300 102-1, Amendment 1 and ETS 300 403-1[12] both specify the call state to be the state *after* the errored message has been processed.
  - ⇒ ETS 300 102-1 [see footnote to ref. 12] specified the use of only the definite (short) form of ITU-T Recommendation X.209 [27] Basic Encoding Rules for the Facility information element. Subsequently, all specification of the generic functional protocol for supplementary services (Digital Calling Features) was moved to ETS 300 196-1 [34] and this standard requires the full Basic Encoding Rules to be supported.
- This SIN does not repeat the technical specification given in the ETSI standards. It defines which network implementation options have been selected for the Openreach service and gives implementation advice in those areas which have proven to be problematical for full interoperability between terminals and network. For example:
  - ⇒ Clauses A.4 and A.5 respectively give the configurations options supported on the ISDN 2e and ISDN 30e services and implementation options selected for layers 1, 2 and 3 (basic call) of the user-network interface.
  - ⇒ Clause A.7 and its sub-clauses provide the implementation options selected for each of the Digital Calling Features supported on the BT ISDN.
- The SIN provides information on interworking of services and Digital Calling Features[1] across different networks and between the BT ISDN *full ETSI call control* and *limited ETSI call control* platforms.

---

[1] From 1st September 1999, all supplementary services provided on BT's ISDN Services were re-branded as “Digital Select Services” Following a subsequent re-branding exercise these services are now called Digital Calling Features.

- The SIN provides terminal design guide information both relating to the design of the application protocols and the manner in which network services are invoked and controlled. Much of this information is given in Annex C.
- The primary technical differences between the BT ISDN *full ETSI call control* and *limited ETSI call control* platforms which is expected to impact on terminal design is given in Annex B.
- To aid readers who are already familiar with the details contained in the previous issue of this SIN, Annex D provides a list of the major changes that have been made compared to the previous issue.

1. GENERAL

1.1 The ISDN Services currently offered by Openreach are supported on two network platforms, the *limited ETSI call control* platform and the *full ETSI call control* platform. The *limited ETSI call control* platform was designed and implemented prior to the completion of the European ISDN standards published by the European Telecommunications Standards Institute (ETSI). This network platform uses call control aligned with the then existing implementation and as a consequence, the platform restricted the capability of the BT ISDN to evolve to support the full range of ISDN Services as defined by ETSI.

1.2 The ISDN services supported on the *limited ETSI call control* network platform are:

- BT ISDN 2 Service as defined in SIN 171 [28]
- BT ISDN 30 (DASS 2) Service as defined in SIN 222 [29]
- BT ISDN 30 (I.421) Service as defined in SIN 232 [30].

1.3 This Suppliers Information Note (SIN) describes the BT ISDN 2e and ISDN 30e services provided on the BT Euro-ISDN network platform which uses call control procedures fully aligned with the ISDN architecture as defined by the European (i.e. ETSI) standards. ISDN 30e is the branding for the ISDN primary rate access on BT's Euro-ISDN network platform. In this document, this network platform is referred to as the *full ETSI call control* network platform. The SIN is intended to provide general information about the service for Customer Premises Equipment (CPE) manufacturers and developers.

Note 1: The term ISDN 2 is the Openreach name for the ISDN basic access service provided on the *limited ETSI call control* network platform.
The term ISDN 2e is the Openreach name for its ISDN basic service supported on the *full ETSI call control* network platform.

Note 2: The specification of the ISDN 2e and ISDN 30e customer - network interface using the ETSI standardised Protocol Implementation Conformance Statement is given in SIN 368 [33]

Note 3: An overview of all of the ISDN services provided by Openreach are given in SIN 312 [32]

1.4 A list of the principal changes between this issue and the previous issue of the SIN are given in Annex D. Any future enhancements of the Openreach *full ETSI call control* network platform will be documented in future issues of this SIN.

Note 1: BT currently has no plans to enhance the BT ISDN 30 (DASS 2) Service. Any changes to this service will either be published in a new issue of SIN 222 or else as a new SIN.

2. SERVICE AVAILABILITY

2.1 The BT ISDN Services supported on the Openreach *full ETSI call control* network platform are available and were implemented as follows:

ISDN 2e -	a phased implementation which began at the end 1996 and was completed in October 1997.
ISDN 30e -	a phased implementation which began during autumn 1997 and was completed in January 1999.

The services provided are given in Clause 2.2 with implementation details given in Annex A.

Openreach will withdraw BT ISDN 2e and ISDN 30e Services using full ETSI Call Control by end of January 2027 in line with the closure of the BT UK PSTN.

The international unrestricted 64 kbit/s bearer service was withdrawn by BT Wholesale in March 2017 in light of transition to IP working. This was announced earlier in Issue 5.8 of this SIN.

2.2 The services which are available or are planned to be available on the BT ISDN 2e and ISDN 30e Services, i.e. supported on the *full ETSI call control* network platform, are given in Table 1. Table 1 is not necessarily exhaustive and is provided without prejudice. Reference in the table does not guarantee that any feature or facility listed will be offered as a service. However, the information is indicative of the Openreach expectations for the BT ISDN 2e and ISDN 30e Service on the *full ETSI call control* network platform at the time of publication.

For ease of reference, the list of Digital Calling Features available and planned to be available is given in alphabetical order.

ISDN Service	Relevant Notes
Basic Services:	Note 1
Circuit mode speech bearer	
Circuit mode 64 kbit/s unrestricted bearer	
3.1 kHz audio bearer	
Telephony 3.1 kHz	
Telephony 7 kHz	Note 9
Telefax Group 4	
Videotex	
Videotelephony	Note 9

ISDN Service	Relevant Notes
Eurofile	
FTAM over ISDN	
Telefax Group 2/3	
Teletex	
Digital Select Services (formally Supplementary Services as defined in the relevant ETS): Following a rebranding exercise these services are now called Digital Calling Features.	Note 2
Anonymous Call Rejection (ACR)	
Call Deflection	
Call Forwarding on Busy (CFB)	
Call Forwarding on No reply (CFNR)	
Call Forwarding Unconditional (CFU)	
Call Waiting	Note 7
Calling Line Identification Presentation (CLIP)	
Calling Line Identification Restriction (CLIR)	
Connected Line Identification Presentation (COLP)	
Connected Line Identification Restriction (COLR)	
Direct Dialling In (DDI)	
Call Hold (HOLD)	Note 7
Malicious Call Identification (MCID)	
Multiple Subscriber Number (MSN)	Note 3
Outgoing Call Barring (OCB-F) - Network controlled	
Subaddressing (SUB)	
Terminal Portability (TP)	Note 5
Trunk/Line Hunting	Note 4
Digital Select Services (formally Supplementary Services additional to those defined by ETSI): Following a rebranding exercise these services are now called Digital Calling Features	Note 2
Incoming Call Barring (ICB-F) - Network controlled	

ISDN Service	Relevant Notes
Presentation Number	Note 8
Service Care:	
Option dependent	Note 6

Table 1 - Services supported on the full ETSI call control platform.

Notes to Table 1

1. The term 'Basic Service' includes bearer services, teleservices and terminal application of bearer services.
2. Digital Calling Features are applicable to all basic services.
3. MSN is only applicable to S/T-reference point configuration (see Annex A, section A.7.15). ISDN 30e will only support the T-reference point configuration and hence MSN is only available on ISDN 2e. See Annex A for further details.
4. For some years, ETSI worked on standards for Trunk Hunting and Line Hunting. The ETSI work on Trunk Hunting has been stopped but the Line Hunting standard [59] has been published. The BT implementation is aligned with this standard.
5. In alignment with the ETSI standards, Terminal Portability is only applicable to ISDN basic access configured for S/T reference point working.
6. Various types of service care are available on top of the default level, and can be provided for a charge.
7. Call Hold and Call Waiting are applicable to ISDN 2e S/T reference point working only.
8. Type 1 Presentation number (network stored).
9. From September 2001, the BT network ceased to support the fallback procedure defined in the ETSI standards [13, 14] for telephony 7 kHz and videotelephony. If a calling user signals to the network using the procedures defined in ETS 300 267-1 [15] that fallback is allowed, the network might not provide the correct bearer capability for the resultant call. Hence it is recommended that users do not use the fallback procedure and adopt a multiple call attempt strategy i.e. initially make a call request for the preferred teleservice with fallback not allowed and if this first call attempt fails, try a second call attempt requesting an alternative teleservice (e.g. telephony 3.1 kHz). See Clause C.18 for further information.

Note: In Issue 4 of this SIN, Advice of Charge at the end of a call (AOC-E) was a planned service included in Table 1. It was indicated that the provision of this service was subject to a feasibility study and commercial viability. Marketing information has indicated that there is little demand for AOC-E, primarily due to the proliferation of CPE based charging information systems with WEB based charge databases. In addition, the cost of developing off-switch charging, and potential timescales, are excessive. BT does not therefore plan to launch AOC-E.

3. SERVICE DESCRIPTION

3.1 The BT ISDN 2e and ISDN 30e Services, i.e. *full ETSI call control* network platform, have been designed to support CPE complying with the relevant ETSI ISDN standards. The ISDN 2e and ISDN 30e Services support the basic services and Digital Calling Features listed in Annex A of this SIN in accordance with the ETSI standards listed in the ETSI Technical Report (ETR) ETR 010 - "The ETSI Basic Guide on European ISDN" [7].

3.2 The customer interface is presented to the user via an NTTA (Network Terminating and Test Apparatus).

Note: the NTTA (also known as the NTE - Network Terminating Equipment) performs the NT1 function specified in the ETSI standards.

3.2.1 For the BT ISDN 2e Service, the NTTA (NTE) offers a socket in accordance with EN 28877 [4] for connection of CPE to the service. The NTTA (NTE) is line powered. The service provides Power Source 1 (PS1) restricted in accordance with ETS 300 012 [8]. PS1 normal can be provided using an auxiliary power supply as defined ETS 300 012 [8].

The requirements for the cabling between the CPE and the NTTA (NTE), including passive bus configurations are specified in EN 50098-1 [5]. Also, installers of CPE extension sockets must ensure that only sockets as specified in EN 28877 [4] are provided. Particular care must be taken with the provision of the 100-ohm terminating resistors as specified in EN 50098 [5].

3.2.2 For the BT ISDN 30e Service, the NTTA offers a socket in accordance with EN 28877[2] [4] for connection of CPE to the service. Various technologies are used to provide the ISDN 30e access and the NTTA (NTE) may either be line powered or locally powered depending on the technology used. Locally powered NTTA (NTE) will require a mains supply and as an option, back-up standby power can be provided.

The requirements for the cabling between the CPE and the NTTA (NTE) are specified in EN 50098-2 [6]. As an example, these requirements will be met using unscreened twisted pair (UTP) Class 5 cable of up to 200m in length.

---

[2] ETS 300 011 specifies that the connector for ISDN primary rate access is ISO/IEC 10173 [24]. However, it has been acknowledged in the international standards committee that there are manufacturing problems with the design of this connector. The connector specified in ISO/IEC 10173 has the same basic dimensions as the connector specified in EN 28877 but contains additional keying features to prevent inadvertent connection to services using that connector. The socket on the NTTA (NTE) will permit the insertion of a plug to EN 28877. This is a permitted option in ISO/IEC 10173. **NB. The contact assignment shall be as specified in ISO/IEC 10173 even when a plug to EN 28877 is used.** This change to the connector is included in Edition 2 of ETS 300 011.

4. SERVICE INTERWORKING

Service interworking is applicable to both basic and Digital Calling Features. Interworking can occur:

- within the Openreach network e.g. for calls between ISDN services supported on the *full ETSI call control* network platform and the *limited ETSI call control* network platforms and for calls between ISDN and other networks (e.g. PSTN)
- outside the Openreach network where the call is routed via the international network or to an Other Communication Provider (OCP) network then the OCP/International network may be, for example, ISDN ,PSTN or Mobile.

Details of service interworking for all of the above cases is given in Annex A with Tables A.1 and A.5 giving an overview of the service interworking capabilities for basic and Digital Calling Features respectively.

5. FUTURE DEVELOPMENTS

This document will be updated to include any enhancements to the service which Openreach may offer.

6. CONTACT POINTS

Contacts for further information about the BT ISDN service can be found at
https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do

If you have questions relating to this document then please contact
orsinsfa@openreach.co.uk

7. ABBREVIATIONS

AOC-E - Advice of Charge: charging information at the end of the call
ACR Anonymous Call Rejection
CCITT - The International Telegraph and Telephone Consultative Committee (now called ITU-T)
CD - Call Deflection
CFB - Call Forwarding on Busy
CFNR - Call Forwarding on No Reply
CFU - Call Forwarding Unconditional
CLIP - Calling Line Identification Presentation
CLIR - Calling Line Identification Restriction
COLP - Connected Line Identification Presentation
COLR - Connected Line Identification Restriction

CPE - Customer Premises Equipment
CSH - Called Subscriber Held
CTR - Common Technical Regulation
CW - Call Waiting
DDI - Direct Dialling In
DSS1 - Digital Subscriber Signalling System No. one
DTMF - Dual Tone Multi Frequency
ECMA - European Computer Manufacturers Association
ETR - European Telecommunication Report
ETS - European Telecommunication Standard
ETSI - European Telecommunication Standards Institute
FTAM - File Transfer and Access Management
HLC - High Level Compatibility
HOLD - Call Hold
ICB-F - Incoming Call Barring - Network controlled
ISDN - Integrated Services Digital Network
ISPBX - Integrated Services Private Branch Exchange
ITU-T - International Telecommunications Union - Telecommunications Standardisation Sector
LLC - Low Level Compatibility
MCID - Malicious Call Identification
MSN - Multiple Subscriber Number
NAE - Network Address Extension
NT1 - Network Termination Type 1
NT2 - Network Termination Type 2
NTE - Network Terminating Equipment
NTTA - Network Terminating and Testing Apparatus
OCB-F - Outgoing Call Barring - Network controlled
OCP - Other Communication Provider
PN - Presentation Number
PICS - Protocol Implementation Conformance Statement
PS1 - Power Source 1
PSTN - Public Switched Telephone Network
SIN - Suppliers Information Note
SUB - Subaddressing
TEI - Terminal Endpoint Identifier
TP - Terminal Portability

UPNS	- User-Provided, Not Screened
UTP	- Unscreened Twisted Pair

8. REFERENCES

Ref. No	Document number (Publication Date/Version)	Remarks	Title
1	ITU-T Rec. I.411 (3/93)		ISDN User-Network Interfaces - Reference Configurations
2	CCITT Rec. V.110 (9/92)	same as ECMA 102	Support of data terminal equipment (DTEs) with V-series type interfaces by an ISDN.
3	ITU-T Rec. G.114 (3/93)		One-Way Transmission Delay
4	EN 28877 (9/93) (Same as ISO/IEC 8877)	Connector: contact assignments + mating dimensions	Interface connector and contact assignments for ISDN basic access interface located at reference points S and T
5	EN 50098-1 (3/94)	Customer Premises Cabling	Customer Premises Cabling for Information Technology. Part 1: ISDN basic access
6	EN 50098-2 (10/95)	Customer Premises Cabling	Customer Premises Cabling for Information Technology. Part 2: 2048 kbit/s ISDN primary access and leased line network interface
7	ETR 010 (3/93)	Guide to ETSI ISDN Standards	The ETSI Basic Guide on European ISDN
8	ETS 300 012 (12/91) + Amendment 2 (3/96)	Layer 1 specification	ISDN: Basic user-network interface Layer 1 specification and principles
9	ETS 300 011 Edition 2	Layer 1 specification	ISDN: Primary Rate user-network interface Layer 1 specification and principles
10	ETS 300 233 (5/94) + Amendment 1 (3/96)	Digital section specification	ISDN: Access digital section for ISDN Primary Rate
11	ETS 300 402-2 (12/95) see [3]	DSS1 Protocol Layer 2 specification	ISDN: DSS1 protocol; Data link layer; General protocol specification {Application of ITU-T Recommendation Q.921 (1993)}

---

[3] ETS 300 402-2 is based on ITU-T Recommendation Q.921 (1993) and is an extended and updated version of ETS 300 125 Part 2 (1990) which was based on CCITT Recommendation Q.921 (1988). Annex ZA of ETS 300 402-2 identifies the relevant differences between ETS 300 125 Part 2 and ETS 300 402-2.

Ref. No	**Document number** (Publication Date/Version)	**Remarks**	**Title**
12	ETS 300 403-1 (12/95) + Corrigendum (6/96)see[4]	DSS1 Protocol Layer 3 specification	ISDN: DSS1 protocol; Signalling network layer for circuit-mode basic call control {Application of ITU-T Recommendation Q.931 (1993)}
13	ETS 300 263 (3/94) + Amendment A1 (3/96)	Service Description	ISDN: Telephony 7 kHz teleservice
14	ETS 300 264 (3/94)	Service Description	ISDN: Telephony videotelephony teleservice
15	ETS 300 267-1 (2/94) + Amendment 1 (3/96)	DSS1 Protocol Layer 3 specification	ISDN: Telephony 7 kHz and videotelephony teleservice; DSS1 protocol
16	ETS 300 108 (8/92)	Service Description	ISDN: Circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category
17	ETS 300 109 (8/92)	Service Description	ISDN: Circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category usable for speech information transfer
18	ETS 300 110 (8/92)	Service Description	ISDN: Circuit-mode 64 kbit/s 8 kHz structured bearer service category usable for 3.1 kHz audio information transfer
19	ETS 300 111 (8/92)	Service Description	ISDN: Telephony 3.1 kHz teleservice
20	ETS 300 120 (11/92)	Service Description	ISDN: Service requirements for telefax group 4
21	ETS 300 262 (8/93)	Service Description	ISDN: Syntax-based Videotex teleservice
22	ETS 300 409 (6/95)	Service Description	ISDN: Eurofile transfer teleservice
23	ETS 300 410 (6/95)	Service Description	ISDN: File Transfer & Access Management (FTAM) teleservice
24	ISO/IEC 10173 (1991)	Connector: contact assignments + mating dimensions	ISDN Connector up to 8 pins and up to 2.048 Mbit/s
25	ETS 300 485 (1/96)		ISDN Definition and usage of cause and location in DSS1 and SS7 ISUP.

---

[4] ETS 300 403-1 is based on ITU-T Recommendation Q.931 (1993) and is an extended and updated version of ETS 300 102-1 (1990) which was based on CCITT Recommendation Q.931 (1988). Annex ZA of ETS 300 403-1 identifies the relevant differences between ETS 300 102-1 and ETS 300 403-1.

Ref. No	Document number (Publication Date/Version)	Remarks	Title
26	ITU-T Recommendation G.704		Synchronous Frame Structures used at Primary and Secondary hierarchical levels.
27	ITU-T Recommendation X.209		Specification of basic encoding rules for ASN-1.
28	SIN 171		BT ISDN 2 - Service Description
29	SIN 222		BT ISDN 30 (DASS 2) - Service Description
30	SIN 232		BT ISDN 30 (I.421) - National Service - Service Description
31	SIN 243		BT ISDN International Interworking
32	SIN 312	Overview	BT ISDN Services
33	SIN368		Index of Protocol Implementation Conformance Statements (PICS) for ISDN 2e and ISDN 30e Customer Interfaces

Digital Calling Features references

Ref. No	Document number (publication date/Version)	Scope	Title
34	ETS 300 196-1 (8/93) + Amendment 1 (5/95)	DSS1 Protocol	ISDN: Generic functional protocol for the support of supplementary services.
35	ETS 300 122-1(3/92)	DSS1 Protocol	ISDN: Generic keypad protocol for the support of supplementary services
36	ETS 300 089 (1/92)	Service Description	ISDN: Calling Line Identification Presentation (CLIP) supplementary service (Note: ETS 300 091 covers both CLIP and CLIR services)
37	ETS 300 091 (4/92)	Information Flows	
38	ETS 300 092-1 (4/92) + Amendment 2 (11/94)	DSS1 Protocol	
39	ETS 300 090 (1/92)	Service Description	ISDN: Calling Line Identification Restriction (CLIR) supplementary service (Note: ETS 300 091 covers both CLIP and CLIR services)
40	ETS 300 091 (4/92)	Information Flows	
41	ETS 300 093-1(4/92)	DSS1 Protocol	
42	I-ETS 300 245-1 Edition 2 (2/96)		ISDN: Technical characteristics of telephony terminals: Part 1 General.
43	ETS 300 202 (12/94) + Amendment 1 (9/96)	Service Description	ISDN: Call Deflection (CD) supplementary service
44	ETS 300 206(12/94)	Information Flows	
45	ETS 300 207-1 (12/94)+ Corrigenda 1 (6/96)	DSS1 Protocol	
46	ETS 300 199 (12/94), ETS 300 200 (12/94), ETS 300 201 (12/94) + Amendment 1 (9/96)	Service Description	ISDN: Call Diversion service supplementary services (Call Forwarding on Busy CFB), Call Forwarding Unconditional (CFU) and Call Forwarding on No Reply CFNR) respectively)
47	ETS 300 203 (12/94), ETS 300 204 (12/94), ETS 300 205 (12/94)	Information Flows	

Ref. No	Document number (publication date/Version)	Scope	Title
48	ETS 300 207-1 (12/94) + Corrigendum 1 (6/95)	DSS1 Protocol	(Note: ETS 300 207-1 covers all of the Call Diversion services in a single ETS)
49	ETS 300 056 (10/91) + Amendment 1 (9/96)	Service Description	ISDN: Call Waiting (CW) supplementary service
50	ETS 300 057 (5/92)	Information Flows	
51	ETS 300 058-1 (10/91)	DSS1 Protocol	
52	ETS 300 094 (1/92)	Service Description	ISDN: Connected Line Identification Presentation (COLP) supplementary service (Note: ETS 300 096 covers both COLP and COLR services)
53	ETS 300 096 (5/92)	Information Flows	
54	ETS 300 097-1 (3/92) + Amendment 1 (11/94)	DSS1 Protocol	
55	ETS 300 095 (1/92)	Service Description	ISDN: Connected Line Identification Restriction (COLR) supplementary service: (Note ETS 300 096 covers both COLP and COLR services)
56	ETS 300 096 (5/92)	Information Flows	
57	ETS 300 098-1 (5/92)	DSS1 Protocol	
58	EN 301 082 (7/00)	Service Description	ISDN: Outgoing Call Barring - Fixed (OCB-F)
59	EN 301 479 (8/00)	Service Description	ISDN: Line Hunting (LH)
60	ETS 300 062 (10/91)	Service Description	ISDN: Direct Dialling In (DDI) supplementary service
61	ETS 300 063 (11/91)	Information Flows	
62	ETS 300 064-1 (11/91)	DSS1 Protocol	
63	ETS 300 128 (3/92)	Service Description	ISDN: Malicious Call Identification (MCID) supplementary service
64	ETS 300 129 (5/92)	Information Flows	
65	ETS 300 130-1 (5/92)	DSS1 Protocol	

Ref. No	Document number (publication date/Version)	Scope	Title
66	ETS 300 050 (10/91)	Service Description	ISDN: Multiple Subscriber Number (MSN) supplementary service
67	ETS 300 051 (10/91)	Information Flows	
68	ETS 300 052 (10/91)	DSS1 Protocol	
69	ETS 300 053 (10/91)	Service Description	ISDN: Terminal Portability (TP) supplementary service
70	ETS 300 054 (10/91)	Information Flows	
71	ETS 300 055-1 (10/91)	DSS1 Protocol	
72	ETS 300 059 (10/91)	Service Description	ISDN: Subaddressing (SUB) supplementary service
73	ETS 300 060 (11/91)	Information Flows	
74	ETS 300 061 (11/91)	DSS1 Protocol	
75	ETS 300 139 (3/92)	Service Description	ISDN: Hold supplementary service
76	ETS 300 140 (5/92)	Information Flows	
77	ETS 300 141-1 (5/92) + Corrigendum 2 (4/94)	DSS1 Protocol	
78	EN301 798 (10/00)	Service Description	Anonymous Call Rejection (ACR) supplementary service

10. HISTORY

Issue No.	Date	Reason for change
Issue 1	September 1996	First issue.
Issue 2	September 1997	Provision of enhanced services.
Issue 3	July 1998	Provision of enhanced services.
Issue 4.0	May 1999	Provision of enhanced services.
Issue 4.1	December 1999	Editorial update.
Issue 4.2	June 2000	Editorial update
Issue 4.3	November 2000	Editorial update.
Issue 5	June 2001	Changes to ISDN 2e and ISDN 30e services
Issue 5.1	July 2002	Editorial update
Issue 5.2	April 2003	Approval Requirements statement removed, information available via SINet Useful Contacts page.
Issue 5.3	April 2006	Update to ACR, CD and Outgoing Call Barring specification. Inclusion of Called Party Number information previously published in SIN 277. Remove reference to ISDN Terminal Equipment Compatibility Laboratory which has now ceased.
Issue 5.4	June 2008	Announcement of programme to provide increased transparency of capabilities on international calls. Also editorial updates.
Issue 5.5	November 2011	Amendments to Clause A.7
Issue 5.6	April 2015	Change SINet site references from http://www.sinet.bt.com to http://www.btplc.com/sinet/
Issue 5.7	April 2017	Editorial Update
Issue 5.8	July 2020	Withdraw notice added to Annex A for ISDN 64 kbit/s unrestricted bearer service calls to overseas destinations. BT branding and links have moved to our Openreach site https://www.openreach.co.uk/orpg/home/helpandsupport/sins/sins.do Removed references to SIN 225 (ISDN Connect) in Section 1 and Section 8 as that service was withdrawn in September 2007. Removed references to SIN 275 (BT Highway) in Section 1 and Section 8 as that service as withdrawn in February 2007.
Issue 5.8	June 2021	Annual Review – no changes made – issue number therefore remains the same
Issue 5.8	June 2022	Annual Review – no changes made – issue number therefore remains the same

Issue 5.8	June 2023	Annual Review – no changes made – issue number therefore remains the same
Issue 5.9	January 2025	Text added to Section 2.1 announcing the full withdrawal of ISDN 2e and ISDN 30e Services using full ETSI Call Control

ANNEX A - BT ISDN 2e and ISDN 30e - SERVICE FACILITIES

A.1 Introduction

This document is the means by which BT will formally announce the facilities available on the BT ISDN 2e and ISDN 30e Services i.e. the *full ETSI call control* network platform; updates will be provided when appropriate.

Table 1 in Clause 2.2 in the main body of this SIN identifies those services that are available or planned in conjunction with the introduction of BT 21CN.

This annex provides implementation details of the services and Digital Calling Features. Future issues of this SIN will provide details for any future enhancement of the BT ISDN.

NOTE: Annex C provides without prejudice, non-regulatory information of general interest to manufacturers.

A.2 BASIC SERVICES

A description of the basic service provided is given in the following reference documents

Basic Service	**Reference Document**
64 kbit/s Unrestricted Bearer Service	ETS 300 108 [16]
Speech Mode Bearer Service	ETS 300 109 [17]
3.1 kHz Audio Bearer Service	ETS 300 110 [18]
Telephony 3.1 kHz	ETS 300 111 [19]
Telephony 7 kHz (Note 1)	ETS 300 263 [13]
Videotelephony (Note 1)	ETS 300 264 [14]
Telefax Group 4	ETS 300 120 [20]
Circuit-mode syntax-based videotex	ETS 300 262 [21]
Eurofile transfer	ETS 300 409 [22]
File Transfer and Access Management (FTAM) over ISDN	ETS 300 410 [23]
Telefax Group 2/3	

Teletex	

Note 1: From September 2001, the BT network ceased to support the fallback procedure defined in the ETSI standards [13, 14] for telephony 7 kHz and videotelephony. See Clause C.18 for further information.

Interworking for these basic services with other networks is defined in Table A.1 below together with the associated notes.

Between Basic Service (Note 1)		ISDN 2e or ISDN 30e (i.e. supported on *full ETSI call control* network platform)						
		Speech	64 kbit/s unrestricted	3.1 kHz audio bearer, Telephony 3.1 kHz, Telefax Group 2/3	Telefax Group 4, Teletex, Videotex	Eurofile transfer, FTAM over ISDN	Telephony 7 kHz	Videotelephony
ISDN 2	*Limited ETSI call control network platform*	YES	YES Note 2	YES	YES	Note 4	Note 13	Note 13
ISDN 30 (DASS 2)		YES	YES Note 3	YES	YES	Note 4	Note 13	Note 13
ISDN 30 (I.421)		YES	YES Note 2	YES	YES	Note 4	Note 13	Note 13
ISDN 2e	*Full ETSI call control network platform*	YES	YES	YES	YES	YES	YES Note 12	YES Note 12
ISDN 30e		YES	YES	YES	YES	YES	YES Note 12	YES Note 12
PSTN s		YES Note 5	NO	YES Note 5	NO	NO	NO	NO
OCP's PSTN		YES Note 5	NO	YES Note 5	NO	NO	NO	NO
OCP's ISDN		YES Note 6	YES Note 6	YES Note 6	YES Note 11	YES	Notes 6	Notes 6
Overseas PSTN		YES Note 5	NO	YES Note 5	NO	NO	NO	NO
Overseas ISDN (Notes 8 and 9)		Note 10	YES Notes 7 & 9	Note 10	YES Note 11	YES	Notes 11	Notes 11

Digital Mobile Networks (i.e. GSM)	YES	NO	YES	NO	NO	NO	NO

Table A.1 - Basic Service Interworking Capability

Notes to Table A.1

1. The term 'basic service' includes bearer services, teleservices and terminal application of bearer services.
2. Calls from BT ISDN 2e or ISDN 30e Service (*full ETSI call control* network platform) to an ISDN 2 or ISDN 30 (I.421) user on the *limited ETSI call control* network platform will be subject to restrictions in the codings of High layer compatibility and Low layer compatibility signalling information conveyed between calling and called user. These restrictions are common to both the BT ISDN 2 and ISDN 30 (I.421) Services supported on the *limited ETSI call control* network platform and are documented in SIN 171 and SIN 232.
3. Calls between ISDN 2e or ISDN 30e and ISDN 30 (DASS 2) require mapping of the Bearer capability, High layer compatibility and Low layer compatibility information elements of the DSS1 signalling used for ISDN 2e and ISDN 30e and the Service Indicator Codes of the DASS 2 signalling. The DASS 2 Service Indicator Code is not as feature rich as the DSS1 signalling information elements and as a result the restrictions referred to in Note 2 above apply.
4. Calls from BT ISDN 2e or ISDN 30e Service on the *full ETSI call control* network platform to an ISDN 2 or ISDN 30 (I.421) user on the *limited ETSI call control* network platform will not support the conveyance of the High layer information element for these teleservices between calling and called user. Calls requesting one of these teleservices from the *full ETSI call control* to the *limited ETSI call control* network platform will be handled as a call request for a bearer service with a capability as specified in the Bearer capability information element received from the calling user.
5. Calls from ISDN to PSTN network will be provided as a speech bearer service i.e. the High layer compatibility information element will not be conveyed between calling and called user. Calls from PSTN network to ISDN will be indicated (in accordance with the standards) as 3.1 kHz audio calls with an indication that interworking with PSTN has occurred.
6. Service interworking is provided with Other Communication Providers' (OCP's) ISDN having interconnection with the BT ISDN and supporting these services. Whether there are any restrictions on conveyance between users of Bearer capability, High layer compatibility and Low layer compatibility signalling information is dependent on the OCP's ISDN network implementation and the signalling system used for interconnection between the BT ISDN and the OCP's ISDN.
7. Service interworking is provided with Overseas ISDN having interconnection with the BT ISDN and supporting these services. Whether there are any restrictions on conveyance between users of Bearer capability, High layer compatibility and Low layer compatibility signalling information is dependent on the Overseas ISDN network implementation

and the signalling system used for interconnection between the BT ISDN and the Overseas ISDN.

NB BT has started to withdraw the international unrestricted 64 kbit/s bearer service in light of transition to IP working. This change was briefed out directly to UK CPs, who buy interconnect products, via BT Wholesale in March 2017.

ISDN unrestricted 64 kbit/s bearer service calls to overseas destinations may therefore be rejected by the network as international connections transition to IP and a "clearmode" alternative is not available.

8. Information on which countries can be accessed is available from the Openreach ISDN Helpdesk

9. Further information specific to international interworking between the BT ISDN service and overseas ISDNs is available in SIN 243 [31].

10. Outgoing or incoming international calls requesting a bearer capability of either Speech or 3.1 kHz audio will be handled as PSTN calls. No additional ISDN related signalling (e.g. High layer compatibility, Low layer compatibility and Digital Calling Feature information) will be conveyed to the called user. It is recommended that the "fall back" capability is not attempted for international use as initially this will not be supported. Incoming international PSTN calls will be presented as Speech, see SIN 243. A programme (planned for completion in 2009) is being rolled out to provide increased transparency on international calls and the above restrictions may disappear on some international calls (the calls will still be subject to the capabilities provided by the Overseas ISDN).

11. Service interworking with OCP/International ISDNs having interconnection with the Openreach ISDN is provided when:
    - the OCP/International ISDN supports these services, and
    - the signalling system used for interconnection between the BT ISDN and the OCP/International ISDN supports these services.

    If one of the above conditions is not met, the calls requesting one of the teleservices from the BT ISDN to the OCP/International ISDN will mature as a connection with a capability as specified in the requested Bearer capability information element.

12. From September 2001, the Openreach network ceased to support the fallback procedure defined in the ETSI standards [13, 14] for telephony 7 kHz and videotelephony. If a calling user signals to the network using the procedures defined in ETS 300 267-1 [15] that fallback is allowed, the network may not provide the correct bearer capability for the resultant call. Hence it is recommended that users do not use the fallback procedure and adopt a multiple call attempt strategy ie initially make a call request for the preferred teleservice with fallback not allowed and if this first call attempt

fails, tries a second call attempt requesting an alternative teleservice (eg telephony 3.1 kHz). See Clause C.18 for further information.

13. The *limited ETSI call control platform* (ie ISDN 2, ISDN 30 (I.421) and ISDN 30 (DASS)) does not support the "unrestricted digital information with tones/announcements" bearer capability defined for use with the telephony 7 kHz and videotelephony teleservices. However, see Clause C.18 for further information.

A.3 User Configurations Defined In International Standards

ITU-T Recommendation I.411 [1] defines the reference configurations for the ISDN user-network interface and illustrates a number of physical realisations of these configurations. Figure 1 below provides gives some of the examples from Recommendation I.411.

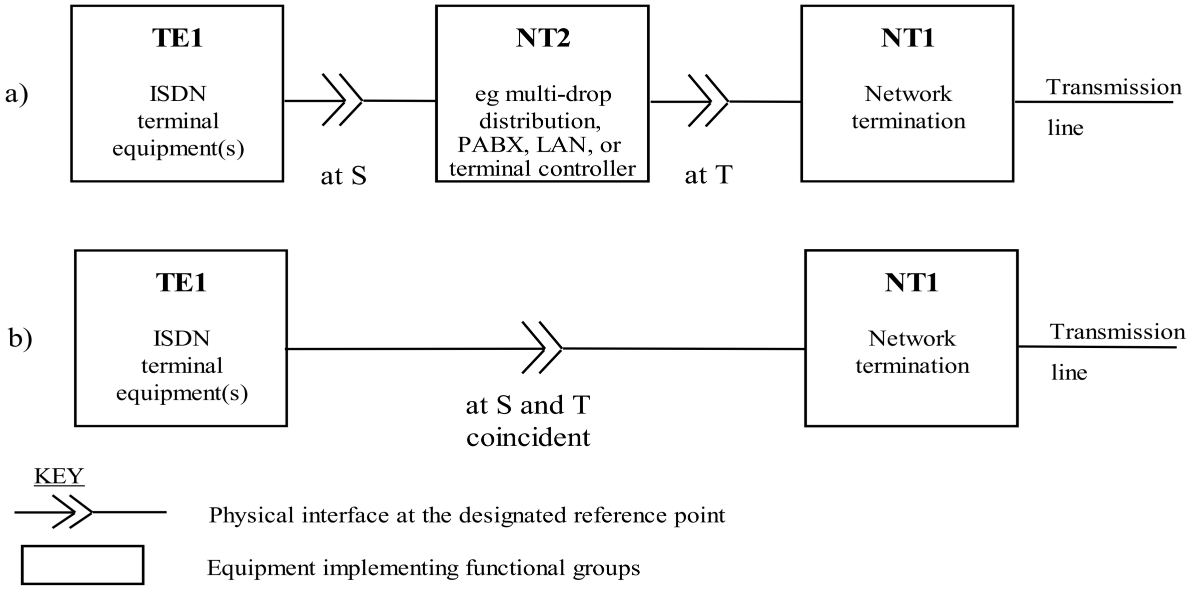

a)
TE1
ISDN terminal equipment(s)
at S
NT2
eg multi-drop distribution, PABX, LAN, or terminal controller
at T
NT1
Network termination
Transmission line
b)
TE1
ISDN terminal equipment(s)
at S and T coincident
NT1
Network termination
Transmission line
KEY
Physical interface at the designated reference point
Equipment implementing functional groups

Figure A.1 - Examples of user configurations

The configurations shown in Figure A.1 are applicable to both basic and primary rate accesses. Configuration b) where there is no NT2 functionality present is typified in ISDN 2e by the passive bus configuration. Configuration b) is also applicable to primary rate access where ISDN terminal equipment (possibly a multifunctional terminal) is connected directly to the NT1.

Different options and services are applicable depending on whether a user's configuration is as in configuration a) (referred to a T-reference point configuration) or as in configuration b) (referred to as S/T-reference point configuration). Configuration a) is applicable to both BT's basic and primary rate accesses; Configuration b) is applicable to BT's ISDN 2e.

Hence basic accesses will have associated user subscription service mark to indicate the user configuration (see Clause A.5, point a) concerning ISDN 30e service).

Differences in a given service depending on the user configuration are specified in the remainder of this annex.

A.4 BT Configuration for ISDN 2e Service

The user-network interface and basic call control procedures for ISDN 2e are specified in:

Layer 1 - ETS 300 012 [8]

Layer 2 - ETS 300 402-2 [11]

Layer 3 - ETS 300 403-1 [12] and ETS 300 267-1 [15]

In addition to these ETSs, the following implementation issues should be noted:

		User configuration	
		S/T-reference point (default)	T-reference point
Layer 1	Activation/Deactivation	Deactivation procedures may be applied (in accordance with ETS 300 012) when access is idle.	Access is permanently activated
Layer 2	TEI (Terminal Endpoint Identifier)	All TEI values supported (including TEI = 0). TEI assignment procedures must be used to assign the TEI. (Note 1)	TEI = 0 only is supported and it is permanently assigned.
Layer 3	Call Offering	Incoming calls will be offered in a SETUP message sent on the broadcast data link i.e. point-to-multipoint procedures will apply.	Point-to-point procedures apply i.e. the SETUP message is sent on the established point-to-point data link.
	B-channel selection - destination side (Note 2)	The destination local exchange will send the Channel identification information element with the preferred/exclusive bit coded "exclusive, only the indicated channel is acceptable".	
	Restart procedure	Not used.	Used. Failure of CPE to respond correctly to ‘Restart’ messages from the network **will** result in circuits/channels being disabled.
	Low layer compatibility negotiation (ref: ETS 300 403-1, Annex J)	Supported (note Low layer compatibility negotiation is only supported on calls originating and terminating on ISDN accesses supported on the *full ETSI call control* network platform).	
	Bearer Connection prior to Call Acceptance (ref: ETS 300 403-1, Annex K)	Not Supported	
	Segmentation Procedure (ref: ETS 300 403-1, Annex H)	Is not used as layer 3 messages will not exceed layer 2 frame size. The use of segmentation procedure in the future following the introduction of additional services is not precluded.	
	Bearer capability selection (ref ETS 300 267-1 [15], clause 5.5)	From September 2001, the BT network ceased to support the fallback procedure defined in the ETSI standards [13, 14] for telephony 7 kHz and videotelephony. See Clause C.18 for further information.	

Table A.2 - ISDN 2e Basic Call Options

Note 1: It should be noted that in accordance with the standards the network may deactivate layer 2 data link connections when the access is idle. Hence the deactivation of layer 2 should not be taken as an indication of failure of the access. As part of the TEI check procedure, the Ai=127 may be used by the network to check all TEI values.

Note 2: Concerning B-channel selection at the originating side, in accordance with the international standard it is recommended that the terminal leaves the B-channel selection to the network to perform, see Clause C.15.

In addition to the above configuration options, the layer 3 network options as specified in ETS 300 403-1 [12] have been implemented as follows:

Coding of Called Party Number information element: the network will accept any Type of Number except network specific and abbreviated numbers with the numbering identification plan encoded "ISDN/telephony numbering plan (ITU-T Recommendation E.164)". (See also C.13).
Note: At the called party side, the network will always send the national number in Called party number information (i.e. the type of number field will be coded National Number and the CPN will be the national number with no prefix digits) except when DDI/MSN is provided (see A.7.12 & A.7.15.)

Sending Complete Indicator: the network option to recognise a "#" character included in the number field of the Called party number information element as a Sending Complete Indicator is not supported (it will be treated as an invalid number).
Note - the network does recognise the Sending complete information element.

Transit Network Selection and Network Specific Facilities information elements: these optional information elements are not supported and if received by the network, these information elements will be treated as unrecognised, non-mandatory information element.

Display information elements: The Display information element is not used by the network. This does not preclude the possibility of the Display information element being used in the future.

Date/Time information element: The Date/Time information element is not sent by the network. This does not preclude the possibility of the Date/Time information element being sent in the future. Therefore, for CPE being designed to take advantage of the possibility of a future enhancement, it should be noted that in accordance with the agreements in ETSI, the year field will be given the value 0 to represent the year 2000. In accordance with ETS 300 403-1 [12], the seconds field (octet 8) is optional and may not be provided by the network. However, it is recommended that CPE should be able to handle the seconds field. Note that the seconds field is actually an invalid octet in ETS 300 102-1 [12].

Status Enquiry: The network may use the Status Enquiry procedure during a call as part of a management/maintenance procedure. Hence it is recommended that CPE should be able to correctly handle the receipt of the STATUS ENQUIRY message.

Call Clearing - application of Called Subscriber Held (CSH) timer: The application of a CSH timer in the call clearing procedure is as follows:

- called party is ISDN 2e or ISDN 30e: First party call clearing (i.e. no CSH timer) applies to all calls regardless of the call type (ie bearer service) being used.
- calling party is ISDN 2e or ISDN 30e: First party call clearing (i.e. no CSH timer) applies if the call type is 64 kbit/s unrestricted (or if the called party is also ISDN 2e or ISDN 30e).
  Speech and 3.1 kHz audio bearer capability calls to PSTN and ISDN 2, ISDN 30 (DASS2) and ISDN 30 (I.421) accesses on the *limited ETSI call control* platform are subject to a CSH timer (as applied in the PSTN) in the network which prevents first party call clearing. In this case the call path will not be cleared until either the calling party clears or the CSH timer (nominally 2 minutes) expires. If the called customer is on the PSTN, the called user will be able to re-answer the call whilst the CSH timer is running.

Call Clearing - Cause values: The network will use (and accept from the CPE as valid cause values) the cause values specified in ETS 300 485 [25].

Error Handling procedures: The network performs and expects terminal equipment to perform error handling procedures in accordance with ETS 300 403-1 [12]. It should be noted that in situations where a STATUS message is sent as part of the error handling procedure, the call state included in the STATUS message should be the call state *after* processing the message containing the error. In ETS 300 102-1 [12] [see footnote to reference 12] the call state to be included in the STATUS message was the call state *in which the errored message was received.* This was subsequently corrected by Amendment A1 to ETS 300 102-1 [12] to the specification as given in ETS 300 403-1 [12].

A.5 BT Configuration for ISDN 30e Service

The user-network interface and basic call control procedures for ISDN 30e are specified in:

Layer 1 - ETS 300 011 [9]

Layer 2 - ETS 300 402-2 [11]

Layer 3 - ETS 300 403-1 [12] and ETS 300 267-1 [15]

In addition to these ETSs, the following implementation issues should be noted:

a) Only the T-reference point user configuration will be supported on ISDN 30e.
b) The minimum entry level for ISDN 30e will be 8 B-channels i.e. the user-network interface will be the standard I.421 interface but only 8 out of the 30 B-channels will be available for use.
c) At layer 1, the access will be permanently activated.
d) At layer 2, TEI = 0 only is supported and it is permanently assigned.
e) At layer 3, the options as specified for T-reference point configuration for ISDN 2e in Table A.2 apply.

In addition, the recommendation given in Note 2 to Table A.2 also applies to ISDN 30e i.e. that for B-channel selection at the originating side, it is recommended that the terminal leaves the B-channel selection to the network to perform. This is particularly relevant for users with primary rate access equipped with less that 30 B-channels (see point b above).

The layer 3 network options implemented as specified for ISDN 2e in Clause A.4 apply.

A.6 Directory Number Allocation

One directory number is allocated to each access or to a group of accesses. Hunting across all channels in the access or group of accesses is provided (see Trunk/Line Hunting in Clause A.7.20).

Note: the allocation of a directory number to a specific B-channel or group of B-channels is not a standardised service and is not compatible with the standardised service. Hence this feature is not offered.

Direct Dialling In (DDI) and Multiple Subscriber Number (MSN) are also available, see Clause A.7.12 and A.7.15 respectively.

A summary of the numbering options applicable to ISDN 2e and ISDN 30e services is given respectively in Tables A.3 and A.4 below.

T Ref. Configuration	**S/T Ref. Configuration**

Up to 5 Single Directory Numbers or Up to 5 DDI ranges or 1 Single Directory Number and a Maximum of up to 4 DDI ranges or 2 Single Directory Numbers and a Maximum of up to 3 DDI ranges or 3 Single Directory Numbers and a Maximum of up to 2 DDI ranges or 4 Single Directory Numbers and a Maximum of up to 1 DDI range	Single Directory Number or MSN (multiple exchange numbers, not necessarily contiguous, in exchange numbering range, up to a maximum of 10 numbers)

Table A.3 - Directory Numbering Options for ISDN 2e

Up to 5 Single Directory Numbers or Up to 5 DDI ranges or 1 Single Directory Number and a Maximum of up to 4 DDI ranges or 2 Single Directory Numbers and a Maximum of up to 3 DDI ranges or 3 Single Directory Numbers and a Maximum of up to 2 DDI ranges or 4 Single Directory Numbers and a Maximum of up to 1 DDI range

Table A.4 - Directory Numbering Options for ISDN 30e

NOTE: The Single Directory Numbers are presented technically in the same way as DDI.

A.7 Digital Calling Features

This Annex provides a description of those Digital Calling Features (as listed in Table 1 in Clause 2.2 in the main body of this SIN) which are available or planned in conjunction with BT 21CN. A charge (rental, usage and/or connection charge) for these Digital Calling Features may be made. For convenience, the Digital Calling Features in this section are given in alphabetical order.

The following sub-clauses provide a description of each Digital Calling Feature. However, reference should be made to the relevant standard for a complete description of the service.

Note: For those Digital Calling Features using the Facility information element, see Clause C.9 concerning the coding of this information element.

Some Digital Calling Features (e.g. outgoing call barring) have only local significance to the served user whereas others (e.g. subaddressing) require capability at both ends of the connection. For these latter Digital Calling Features, interworking with other networks needs to be considered and is specified in Table A.5 below.

Between Digital Calling Feature		ISDN 2e or ISDN 30e (i.e. supported on *full ETSI call control* network platform)				
		CF, CD	TP, CW, HOLD	CLIP	COLP	Subaddressing
ISDN 2	*Limited ETSI call control network platform*	YES Note 9	YES Note 1	YES Note 2	NO	YES Note 5
ISDN 30 (DASS 2)		YES Note 9	YES Note 1	YES Note 2	NO	YES Note 5
ISDN 30 (I.421)		YES Note 9	YES Note 1	YES Note 2	NO	YES Note 5
ISDN 2e	*Full ETSI call control network platform*	YES	YES	YES	YES	YES
ISDN 30e		YES	YES	YES	YES	YES
PSTN		YES Note 8	YES Note 1	YES Note 3	NO	NO
OCP's PSTN		YES Note 8	YES Note 1	YES Note 3	NO	NO
OCP's ISDN		YES Note 4	YES Note 1	YES Note 4	YES Note 4	YES Note 4
Overseas PSTN		YES Note 8	YES Note 1	YES Note 3	NO	NO
Overseas ISDN		YES Notes 4 & 7	YES Notes 1 & 7	YES Notes 4 & 7	YES Notes 4 & 7	YES Notes 4 & 7
Digital Mobile Networks		YES Note 8	YES Note 1	YES Note 6	NO	NO

Table A.5 - Digital Calling Features **Interworking Capability**

Notes to Table A.5

1. D-channel notification to the remote user (which are included as part of the TP, CW and HOLD Digital Calling Features) will not be transferred if the remote user is connected to the ISDN supported on the *limited ETSI call control* network platform, PSTN or mobile network. If the remote user is on an OCP's ISDN or Overseas ISDN, the transfer of the outband notification

is dependent on the signalling system used for connection of the BT ISDN and the OCP's/Overseas ISDN and also on the ISDN implementation to which the remote user is connected. Terminal Portability is appropriate to lines configured as S/T Reference (Point-to-Multi point).

2. The inclusion of calling party subaddress is not supported - see clause A.7.8.1 for details.
3. On calls from ISDN to PSTN with calling line identity display (e.g. CDS™) facility, the calling party number, if available, will be presented to the PSTN user. Any calling party subaddress information will be discarded. On calls from PSTN to ISDN, the PSTN network provided calling line identity, if available, will be presented to the ISDN user.

4. Service interworking is provided with OCP's/Overseas ISDN having interconnection with the BT ISDN and supporting these services. Whether there are any restrictions on the service is dependent on the signalling system used for interconnection and the ISDN implementation in the OCP/Overseas network. Information on ISDN interconnection with Overseas networks is available from the BT ISDN Helpdesk (see http://www.btplc.com/sinet/ for contact details).

5. There are restrictions in the length and type of subaddress information which can be exchanged - see clause A.7.18.1 for details.
6. On calls from ISDN to mobile networks with calling line identity facility, the calling party number, if available, will be presented to the mobile user. Any calling party subaddress information will be discarded. On calls from mobile networks to ISDN, the mobile network provided calling line identity, if available, will be presented to the ISDN user.
7. Outgoing or incoming international calls requesting a bearer capability of either Speech or 3.1 kHz audio will be handled as PSTN calls and as a consequence Digital Calling Features associated with these calls which require ISDN signalling will not be available.
   A programme (planned for completion in 2009) is being rolled out to provide increased transparency on international calls and the above restrictions may disappear on some international calls (the calls will still be subject to the capabilities provided by the Overseas ISDN).
8. Voice calls only and D-channel notification to the remote user will not be transferred if the remote user is connected to the ISDN supported on the limited ETSI call control network platform, PSTN or mobile network. If the remote user is on an OCP's ISDN or Overseas ISDN, the transfer of the outband notification is dependent on the signalling system used for connection of the BT ISDN and the OCP's/Overseas ISDN and also on the ISDN implementation to which the remote user is connected.
9. Call Forwarding and Call Deflection applied on an ISDN access supported on the full ETSI call control network platform will operate as described in the relevant Clause in Section A.7 of this SIN with the exception that D-

channel notification to the remote user will not be transferred if the remote user is connected to the ISDN supported on the limited ETSI call *control* network platform. Call Diversion applied on an ISDN access supported on the *limited ETSI call control* network platform will operate as described in the relevant SIN for that access. Note: Incoming PSTN calls are forwarded as 3.1 kHz.

A.7.1 Anonymous Call Rejection (ACR)

Reference EN 301 798 [78].

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations.

When active, this service will cause the network to reject incoming calls to the served user from users or subscribers who have restricted the presentation of their calling line identity using the CLIR service. ACR will reject all calls with CLI marked "presentation restricted" according to CLIR. The calls are rejected regardless of the current state (e.g. free or busy) of the served user's access. The ACR supplementary service will not reject calls with a CLI marked "presentation restricted by network". The served user's ability to originate calls is unaffected by the ACR supplementary service.

This service does not preclude a customer/CPE based solution for ACR being implemented.

A.7.2 Call Deflection (CD)

Reference ETS 300 202 [45], ETS 300 206 [46] and ETS 300 207-1 [47].

Call Deflection enables the served user to respond to an incoming call by requesting redirection of that call to another user. The call deflection feature can only be invoked before connection is established by the served user i.e. in response to the offered call, or during the period that the served user is being informed of the call. The served user's ability to originate calls is unaffected by the CD digital calling feature. Up to 5 diversions are permitted per call. Call Deflection is only supported on basic rate access S&T reference (P-MP) configurations. A Q931 facility message containing a Call Deflection invoke facility message should be sent using 'operation-value local value = 13'. A similar method of forwarding calls can be achieved on T-reference configurations through the use of Partial Rerouting which is supported on basic and primary rate T-reference (P-P) configurations. A Q931 facility message containing a Partial Re-route invoke message should be sent from the TE at the served user using 'operation-value local value = 14' and must contain a rerouting reason and the routing counter within the message content.

Normal call charges apply for the deflected leg of the call.

A.7.3 Call Forwarding on Busy (CFB)

Reference ETS 300 199 [46], ETS 300 203 [47] and ETS 300 207-1 [48].

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations.

Enables a served user to have the network redirect to another user, calls which are addressed to the served user's ISDN number and meet busy. The CFB Digital Calling Feature may operate on all calls, or just those associated with specified basic services, CFB is presently restricted to operate on all calls. The served user's ability to originate calls is unaffected by the CFB Digital Calling Feature . Up to 5 diversions are permitted per call.

The following implementation options are supported or planned to be supported:

- CFB may be provided against the number associated with the access/group of access or per MSN number. For DDI numbers, a single forwarded to number applies to all numbers in the DDI range(s).
- Notification to served user of forwarding is supported.
- Notification to calling user of forwarding is supported (unless COLR is activated).
- Notification to served user of forwarding being activated, on attempted outgoing calls is supported.
- Presentation of served user's ISDN number to forwarded-to user is supported (unless CLIR is activated).
- The ability to allow the served user to activate, deactivate and interrogate the service for all MSN numbers or all DDI ranges on the access, is planned to be provided.
- Interaction of MCID/CF. Registration of the last diverting user supported.
- The capability to differentiate call handing based on basic service is planned to be supported e.g. it is possible to apply CFB to only 64 kbit/s unrestricted bearer service calls, see Note 1.
- Partial re-routing option is supported (partial re-routing is where a private ISDN detects that the redirection is back to a destination in the public ISDN and the private ISDN requests that the redirection is performed by the public ISDN).
- In accordance with the international standards, CFB will take place if a user determined user-busy or network determined busy condition is encountered. Hence, CPE failure will not normally result in call forwarding since a response from the CPE is required to indicate the "user determined subscriber busy" condition. Forwarding will take place, even if there is failure of the CPE, if "network determined user busy" condition is encountered.

Note 1:unlike the Call Diversion service available on the ISDN service supported on the *limited ETSI call control* network platform, the CFB service is applicable to all basic services e.g. to 64 kbit/s unrestricted data calls as well as speech/3.1 kHz audio calls.

Note 2: Charges for the forwarded leg of the call will not be displayed separately in the customer's bill.

Note 3: In accordance with the international standards, ISDN bearer failure will not result in call forwarding, (unlike the ISDN services supported on the limited ETSI call control platform.

Note 4: When a speech call from a PSTN is forwarded it is given a bearer capability of 3.1 kHz.

Note 5: When CFB is activated, the network may replace the normal dial tone with interrupted dial tone to the served user during normal outgoing call establishment.

Note 6: In order to prevent problems created by customer misuse, a limit of 10 calls has been placed on the number of forwarded calls in the ringing phase.

A.7.4 Call Forwarding on No Reply (CFNR)

Reference ETS 300 201 [46], ETS 300 205 [47] and ETS 300 207-1 [48].

This service applies to both basic access and primary rate access and to both T and S/T configurations.

Enables a served user to have the network redirect to another user, calls which are addressed to the served user's ISDN number and for which the connection is not established within a defined period of time. The CFNR Digital Calling Feature may operate on all calls, or just those associated with specified basic services CFNR is presently restricted to operate on all calls only. The served user's ability to originate calls is unaffected by the CFNR Digital Calling Feature. Up to 5 diversions are permitted per call.

The CFNR Digital Calling Feature can only be invoked by the network after the call has been offered to the served user and an indication that the called user is being informed of the call has been received.

The following implementation options are supported:

- CFNR may be provided against the number associated with the access/group of access or per MSN number. For DDI numbers, a single forwarded to number applies to all numbers in the DDI range(s).
- Notification to served user of forwarding is supported.
- Notification to calling user of forwarding is supported, (unless COLR is activated).
- Notification to served user of forwarding being activated, on attempted outgoing calls is supported.
- Presentation of served users ISDN number to forwarded-to user is supported, (unless CLIR is activated).

- The ability to allow the served user to activate, deactivate and interrogate the service for all MSN numbers or all DDI ranges on the access, is planned to be provided.
- Interaction of MCID/CF. Registration of the last diverting user supported.
- The capability to differentiate call handing based on basic service is planned to be supported e.g. it is possible to apply CFNR to only 64 kbit/s unrestricted bearer service calls, see Note 1.
- Partial re-routing option is supported (partial re-routing is where a private ISDN detects that the redirection is back to a destination in the public ISDN and the private ISDN requests that the redirection is performed by the public ISDN).

Note 1: unlike the Call Diversion service available on the ISDN service supported on the limited ETSI call control network platform, the CFNR service is applicable to all basic services e.g. to 64 kbit/s unrestricted data calls as well as speech/3.1 kHz audio calls.

Note 2: Charges for the forwarded leg of the call will not be displayed separately in the customer's bill.

Note 3: When a speech call from a PSTN is forwarded it is given a bearer capability of 3.1 kHz.

Note 4: When CFNR is activated, the network may replace the normal dial tone with interrupted dial tone to the served user during normal outgoing call establishment.

Note 5: In order to prevent problems created by customer misuse, a limit of 10 calls has been placed on the number of forwarded calls in the ringing phase.

A.7.5 Call Forwarding Unconditional (CFU)

Reference ETS 300 200 [46], ETS 300 204 [47] and ETS 300 207-1 [48].

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations.

Enables a served user to have the network redirect to another user, calls which are addressed to the served user's ISDN number. The CFU Digital Calling Feature may operate on all calls, or just those associated with specified basic services CFU is presently restricted to operate on all calls only. The served user's ability to originate calls is unaffected by the CFU Digital Calling Feature. After the CFU Digital Calling Feature has been activated, calls are forwarded independent of the status of the served user. Up to 5 diversions are permitted per call.

The following implementation options are supported:

- CFU may be provided against the number associated with the access/group of access or per MSN number. For DDI numbers, a single forwarded to number applies to all numbers in the DDI range(s).
- Notification to served user of forwarding is supported.
- Notification to calling user of forwarding is supported, (unless COLR is activated).
- Notification to served user of forwarding being activated, on attempted outgoing calls is supported.
- Presentation of served users ISDN number to forwarded-to user is supported, (unless CLIR is activated).
- The ability to allow the served user to activate, deactivate and interrogate the service for all MSN numbers or all DDI ranges on the access, is planned to be provided.
- Interaction of MCID/CF. Registration of the last diverting user supported.
- The capability to differentiate call handing based on basic service is planned to be supported e.g. it is possible to apply CFB to only 64 kbit/s unrestricted bearer service calls, see Note 1.
- Partial re-routing option is supported, (partial re-routing is where a private ISDN detects that the redirection is back to a destination in the public ISDN and the private ISDN requests that the redirection is performed by the public ISDN).

Note 1: unlike the Call Diversion service available on the ISDN service supported on the *limited ETSI call control* network platform, the CFU service is applicable to all basic services e.g. to 64 kbit/s unrestricted data calls as well as speech/3.1 kHz audio calls.

Note 2: Charges for the forwarded leg of the call will not be displayed separately in the customer's bill.

Note 3: When a speech call from a PSTN is forwarded it is given a bearer capability of 3.1 kHz.

Note 4: When CFU is activated, the network may replace the normal dial tone with interrupted dial tone to the served user during normal outgoing call establishment.

Note 5: In order to prevent problems created by customer misuse, a limit of 10 calls has been placed on the number of forwarded calls in the ringing phase.

A.7.6 Call Hold (HOLD)

Reference ETS 300 139 [75], ETS 300 140 [76] and ETS 300 141-1 [77].

This service applies to BT's basic access operating in the S/T-reference point configuration only.

Allows a user to interrupt communications on an existing call and then subsequently, if desired, re-establish communications.

Note: in accordance with the standards, the network will not prevent both users from putting the call on hold at the same time. The network cannot monitor calls in this state and call charging will continue. It is the user's responsibility to ensure that held calls are eventually cleared. See also Annex C, Clause C.10.

A.7.7 Call Waiting (CW)

Reference ETS 300 056 [49], ETS 300 057 [50] and ETS 300 058-1 [51].

This service applies to BT's basic access operating in the S/T-reference point configuration only.

Permits a user to be informed of an incoming call (as per basic call procedures) with an indication that no interface channel is available. The user then has the choice of accepting, rejecting or ignoring the waiting call (as per the basic call procedures).

Up to four calls can be waiting at any one time.

A.7.8 Calling Line Identification Presentation (CLIP)

Reference ETS 300 089 [36], ETS 300 091 [37] and ETS 300 092-1 [38].

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations.

Enables the called party to receive the calling line identity of the calling party. The delivery of calling line identity is available as a Digital Calling Feature. The called (and not the calling) party is the served user of this service.

Where both calling and called user are connected to the ISDN supported on the *full ETSI call control* network platform, the capability to convey the full calling party subaddress from calling to called party as part of the CLIP service is supported. The network cannot be responsible for the content of this subaddress i.e. there is no network screening applied to the subaddress information.

The following options are NOT offered:

- the delivery of 2 numbers at the called subscriber's user-network interface (see Annex A of ETS 300 089 [36]),
- the special arrangement to permit calling users to send User-Provided, Not Screened (UPNS) numbers.

Note 1: Called users may receive UPNS number indicators in association with the Presentation Number (PN) Digital Calling Feature, see A.7.17.

The calling user may provide the calling party number, particularly in the case when the call originates on an ISDN access with DDI or MSN. The calling user may provide the DDI or MSN digits or the full subscriber, national or international ISDN number. Since DDI/MSN numbers could be widely separated in numbering space, it is recommended that CPE provide the *full* national number. Where only the DDI or MSN digits are provided (i.e. a partial ISDN number) the "type of number" field of the Calling party number information element shall be coded "unknown". Where the full ISDN number is provided, the "type of number" shall be coded "subscriber number", "national number" or "international number" as appropriate and no prefix digits shall be included in the calling party number (in accordance with the standard). The calling party number provided by the calling user will be screened by the network. When the calling user does not provide the DDI or MSN digits, then the originating local exchange will insert a default directory number which will normally be the directory number used for billing purposes (but see Clause A.7.17 on Presentation Number for a potential alternative option).

At the called side, the default coding of the Calling party number information element delivered from the network to the user will be with the numbering plan identifier field coded "ISDN/telephony numbering plan (Recommendation E.164)" and the type of number field coded "national number" unless the call is an international call, in which case the type of number field will be coded "international number".

Note: on the *limited ETSI call control* network platform, the default setting for type of number field was “unknown”. Non-ETSI compliant CPE may ignore the coding of the type of number field in which case, if the CPE is moved from the *limited ETSI* to *full ETSI call control* network platform this may result in any prefix digits (e.g. 0 for national calls) to be omitted from the calling line identification presented to the user.

A.7.8.1 Interworking with ISDN Services supported on the *limited ETSI call control* network platform

When the served (i.e. called) user is connected to the BT ISDN Services supported on the *limited ETSI call control* network platform, then the user receives the services provided by that platform. This means that for calls from an ISDN user supported on the *full ETSI call control* network platform providing Calling party subaddress to an ISDN user supported on the *limited ETSI call control* network platform, the Calling party number will be delivered but the Calling party subaddress will be discarded (without notification to calling or called user).

Similarly, on calls in the reverse direction, a Calling party subaddress will be discarded at the originating local exchange (as it is not supported on the *limited ETSI call control* network platform) and the Calling Party number will be conveyed to the ISDN user supported on the *full ETSI call control* network platform.

A.7.8.2 Interworking with PSTN CDS™ (Caller Display Services)

When the served (i.e. called) user is connected to the BT PSTN with CDS™, then the user receives the services provided to the PSTN i.e. the user will receive the Calling party number but no Calling party subaddress.

On calls from PSTN to ISDN, as the PSTN user does not have the capability of indicating the DDI number, the PSTN always provides a network provided number and this will be delivered to the ISDN called user. (Note - Subaddressing is not a facility on the PSTN).

For interworking with the PSTN Presentation Number Digital Calling Feature, see Clause A.7.17.1.

A.7.9 Calling Line Identification Restriction (CLIR)

Reference ETS 300 090 [39], ETS 300 091 [40] and ETS 300 093-1 [41].

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations.

Customers can request that their calling line identity (ISDN number) is not released to the customers they are calling. The following subscription options are available:

a) temporary mode (i.e. setting can be overridden by user) - presentation restricted

b) temporary mode (i.e. setting can be overridden by user) - presentation not restricted i.e. their calling line identity will be released and forwarded to the called user.

Option b) is the default for all users (including users with ex-directory numbers).

In either of the temporary modes (options a or b), the user can override the restricted/not restricted setting by use of the "presentation indicator" in the Calling party number information element or by using in the called party number the prefix digits “141” to restrict on a per call basis and 1470 to release on a per call basis. (Note: when prefix digits are included in the called party number, the type of number in the Called Party Number information element shall be set to "unknown").

Note - the CLIR subscription option is independent of the subscription option selected for COLR.

The network option for the called user to allocated override category (ref. ETS 300 090, clause 6.2.3.2) is not supported.

A.7.10 Connected Line Identification Presentation (COLP)

Reference ETS 300 094 [52], ETS 300 096 [53] and ETS 300 097-1 [54]

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations. It is applicable when both called and calling parties are both supported on the *full ETSI call control* network platform.

Provides the calling party with the possibility to receive identification of the connected party. This Digital Calling Feature is not a dialling check i.e. if the call has been subject to call forwarding, it is the connected number and not the called party number which is provided to the calling user. The network shall deliver in the Connected number information element the connected line identity to the calling party on call acceptance regardless of the terminal capability to handle the information. The calling (and not the called) party is the served user of this service.

Where both calling and called user are connected to the ISDN supported on the *full ETSI call control* network platform, the capability to convey the full Called party subaddress from called to calling party as part of the COLP service is supported. The network cannot be responsible for the content of this subaddress i.e. there is no network screening applied to the subaddress information. Table A.5 defines the capabilities when network interworking is encountered.

The special arrangement to permit the connected user to send a User Provided, Not Screened (UPNS) number is not offered.

Note 1: Called users may receive UPNS number indicators in association with the Presentation Number (PN) Digital Calling Feature, see A.7.17.

The called user may provide the connected number, particularly in the case when the call terminates on an ISDN access with DDI or MSN. The called user may provide the DDI or MSN digits or the full subscriber, national or international ISDN number. Where only the DDI or MSN digits are provided (i.e. a partial ISDN number) the "type of number" field of the Connected number information element shall be coded "unknown". Where the full ISDN number is provided, the "type of number" shall be coded "subscriber number", "national number" or "international number" as appropriate and prefix digits shall not be included in the Connected number (in accordance with the standard). The Connected number provided by the called user will be screened by the network. When the called user does not provide the DDI or MSN digits, then the destination local exchange will insert a default directory number which will be the directory number in the DDI or MSN group which is used for billing purposes.

A.7.11 Connected Line Identification Restriction (COLR)

Reference ETS 300 095 [55], ETS 300 096 [56] and ETS 300 098-1 [57]

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations.

This service is offered to the connected party to prevent presentation of the connected party's ISDN number and subaddress information (if any), to the calling party.

Customers can request that their line identity (ISDN number) is not released to the calling customers. The following subscription options are available:

a) temporary mode (i.e. setting can be overridden by user) - presentation restricted

b) temporary mode (i.e. setting can be overridden by user) - presentation not restricted i.e. their connected line identity will be released and forwarded to the calling user.

Option (b) is the default for all users (including users with ex-directory numbers).

In either of the temporary modes (options a or b), the user can override the restricted/not restricted setting by use of the "presentation indicator" in the Connected number information element.

Note - the COLR subscription option is independent of the subscription option selected for CLIR.

The network option for the calling user to an allocated override category (ref. ETS 300 095, clause 6.2.3.2) is not supported.

A.7.12 Direct Dialling In (DDI)

Reference ETS 300 062 [60], ETS 300 063 [61] and ETS 300 064-1 [62].

This service applies to both basic access and primary rate access operating in the T-reference point configuration only.

Enables a user to call directly via the public ISDN a user on a private ISDN (e.g. ISPBX) by use of the public ISDN numbering plan. For DDI, more than one public network number is assigned to a single access or group of accesses.

The following user options are supported at the called side for the delivery of the called party number to the user:

a) the full national number is delivered. In this case the "type of number" field of the Called party number information element is coded "national number". No prefix digits (e.g. the initial 0) will be included.

b) the DDI digits are delivered from the network to the user in the "number digits" field of the Called party number information element according to the procedures of ETS 300 403-1 [12]. The "type of number" field of the Called party number information element is coded "unknown". The number of digits delivered from the network to the user is set to 6 digits (or 7 in some area eg in 020 7 and 020 8 numbering areas) but this number is changeable on request.

Option (b) is the default option although this does not preclude the default changing to option (a) in the future. It is recommended that terminal equipment is designed to accept full national number as in option (a) and have the capability to route incoming calls even if less digits are delivered. For all options, the numbering identification plan will be coded "ISDN/telephony numbering plan (Recommendation E.164)".

The directory numbers in a DDI group are consecutive. Up to 5 separate DDI groups can be allocated to an access or group of accesses. Numbers may be assigned in ranges of varying size. Each range may contain up to 10,000 numbers.

A single "service profile" applies to all of the numbers in a particular DDI group and the same "service profile" will apply to all DDI groups allocated to an access or group of accesses. A "service profile" specifies what services are applicable e.g. Digital Calling Features such as call forwarding, calling line identity restriction, etc.

The full CLI service will be provided to all DDI groups (i.e. the calling line identity of each individual DDI number could be sent as the calling party number). Providing that customers' CPE provides Calling party information which can be verified by the network as being appropriate to the access. If the information cannot be verified then the default calling line identification of the access (or the Presentation number - see Clause A.7.17) will be provided. The default calling line identification number will normally be the billing number of the user.

Direct Dialling In and Multiple Subscriber Number are mutually exclusive i.e. they cannot be provided on the same access.

A.7.13 Incoming Call Barring (ICB-F)

This service applies to both basic access and primary rate access.

The facility, under network control, allows the user to place restrictions on the receipt of incoming calls.

A.7.14 Malicious Call Identification (MCID)

Reference ETS 300 128 [63], ETS 300 129 [64] and ETS 300 130-1 [65].

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations. The service is only provided on a temporary basis after prior arrangement with BT.

Enables an incoming call to be identified and registered in the network and used for call tracing purposes. The network option to enable automatic invocation of MCID Digital Calling Feature on calls to the served user which are not answered is not provided.

If the served user also has the DDI or MSN Digital Calling Features, then the MCID service will be provided for a specific ISDN number(s) forming part of the DDI or MSN Digital Calling Feature.

In addition to the use of a Facility information element in a FACILITY message (as specified in ETS 300 130) to invoke the MCID Digital Calling Feature, the network also supports the use of the Keypad protocol (as specified in ETS 300 122-1 [35]) to invoke this service.

To invoke the MCID Digital Calling Feature using the Keypad protocol, the called user shall send the IA5 character string "*39#" in a single Keypad facility information element in an INFORMATION message (i.e. enbloc procedures only shall be used). This INFORMATION message uses the call reference used for the other call control messages associated to that call and it may be sent in the same states as those specified for sending the FACILITY message in ETS 300 130.

Note: It is particularly important in the MCID Digital Calling Feature that CPE using the Keypad protocol to support this service does not generate inband MF4 signalling as well as the D-channel Keypad protocol as the MF4 signalling could notify the far end user that MCID is being invoked.

A.7.15 Multiple Subscriber Number (MSN)

Reference ETS 300 050 [66], ETS 300 051 [67] and ETS 300 052 [68].

This service applies to accesses operating in the S/T-reference point configuration only. MSN will only be applicable to ISDN basic access since only T-reference point configuration will be supported on primary rate access.

Enables up to 10 directory numbers to be assigned to a single access. The directory numbers allocated to an access are dependant on availability within the exchange numbering plan and may not be contiguous.

The following user options are supported at the called side for the delivery of the called party number to the user:

a) the full national number is delivered. In this case the "type of number" field of the Called party number information element is coded "national number". No prefix digits (e.g. the initial 0) will be included.

b) the MSN digits are delivered from the network to the user in the "number digits" field of the Called party number information element according to the procedures of ETS 300 403-1 [12]. The "type of number" field of the Called party number information element is coded "unknown". The number of digits delivered from the network to the user is set to 6 digits (or 7 in some area eg in 020 7 and 020 8 numbering areas) but this number is changeable on request.

Option (b) is the default option although this does not preclude the default changing to option (a) in the future. It is recommended that terminal equipment is designed to accept full national number as in option (a) and have the capability to route incoming calls even if less digits are delivered. For all options, the numbering identification plan will be coded "ISDN/telephony numbering plan (Recommendation E.164)".

Direct Dialling In and Multiple Subscriber Number are mutually exclusive i.e. they cannot be provided on the same access.

A separate service profile can be associated with each MSN number on an access. A "service profile" specifies what services are applicable e.g. Digital Calling Features such as call forwarding, calling line identity restriction, etc.

As stated in the international standards, it should be noted that if MSN is to be used for terminal identification in the case when a number of terminals are connected to a passive bus on an ISDN 2e access, then all terminals on that passive bus must have a unique MSN number.

A.7.16 Outgoing Call Barring (OCB-F)

Reference EN 301 082 [58].

This service applies to both basic access and primary rate access.

This facility, under network control, allows the user to place restrictions on the destinations to which outgoing calls may be placed. The facility is available on a permanent (for all calls) or pre-arranged basis.

The categories of pre-arranged outgoing call barring include (only one category can be selected at a time):

- all calls (except emergency, fault repair and freephone)
- all international calls and premium rate services
- operator controlled calls (except emergency, fault repair and freephone)
- all national and international calls (except emergency, fault repair and freephone)
- calls to international, operator and premium rate services

When outgoing call barring is activated, the network may replace the normal dial tone with interrupted dial tone to the served user during normal call establishment.

From November 2006, the following 7 categories of outgoing call barring will be progressively introduced. Existing customers will keep their existing selected outgoing call barring category unchanged.

- all calls (except emergency, fault repair and freephone)
- all international calls services (allows all other calls, including international calls via the operator)
- operator controlled calls (except emergency, fault repair and freephone)

- all national and international calls including calls to mobile phones (except emergency, fault repair and freephone)
- calls using * (Network Services)
- calls to UK premium rate services
- calls to international premium rate services

A.7.17 Presentation Number (PN)

The Presentation Number Digital Calling Feature is not an ETSI specified service.

This service applies to both basic access and primary rate access. The service is provided after prior arrangement with BT.

The service allows a customer to specify the number which the network releases as their calling line identity on outgoing calls. The number specified will be subject to an authorisation process prior to BT providing it. If a customer has DDI or MSN as well as Presentation Number Digital Calling Feature, then the customer may have the ability, with CPE support, to over-write the Presentation Number with the User Provided Verified and Passed number (i.e. the extension (DDI) number or MSN number). When originating a call, if the user includes in the SETUP message the Calling party number information element containing a valid DDI or MSN number, then this Calling party number and not the Presentation Number will be forwarded to the called user.

The screening indicator associated with a Presentation Number will be set to NP (network provided). Hence for calls within the BT network, when PN is seen when using the CLIP service the screening indicator will be set to NP (network provided). For calls originated from OCP/overseas networks, the screening indicator may alternatively be set to UPNS.

CLIR (including its invocation using prefix digits 141 and 1470) will work for Presentation Numbers exactly as it does for ordinary CLIs.

A.7.17.1 Interworking with PSTN CDS™ (Caller Display Services)

The PSTN CDS™ facility does not provide the user with any form of screening indicator. Hence on calls from ISDN to PSTN, the ISDN Presentation Number will be conveyed to the PSTN user but without the UPU screening indicator.

Calls from the PSTN to ISDN, will be marked as NP (Network Provided).

A.7.18 Subaddressing (SUB)

Reference ETS 300 059 [72], ETS 300 060 [73] and ETS 300 061 [74].

This service applies to both basic access and primary rate access and to both T and S/T-reference point configurations.

Enables the expansion of the customer's addressing capacity beyond the ISDN number. This service is provided to the called user. (The procedures associated with Calling party subaddress or Connected party subaddress information elements are part of the CLIP and COLP Digital Calling Features respectively and are not part of the Subaddressing Digital Calling Feature).

In accordance with the standards, all types of subaddress together with the odd/even indicator are supported. The maximum length of the subaddress information in the Called party subaddress information element is 20 octets (which may be coded as either NSAP or User defined). The conveyance of up to 20 octets of subaddress information will only be available if both the calling and called users are supported on the *full ETSI call control* network platform. In accordance with the standard, if a user attempts to transfer more than 20 octets of subaddress information, the network will discard the complete Called party subaddress information element without any indication to the calling user.

A.7.18.1 Interworking with ISDN Services supported on the *limited ETSI call control* network platform

When the served (i.e. called) user is connected to the BT ISDN Services supported on the *limited ETSI call control* network platform, then the user receives the services provided by that platform. This means that for calls from an ISDN user supported on the *full ETSI call control* network platform providing Called party subaddress to an ISDN user supported on the *limited ETSI call control* network platform, the following conditions apply:

The maximum length of the subaddress information in the Called party subaddress information element (NAE - Network Address Extension for DASS 2) supported by the network is 6 octets. If the calling user exceeds this maximum length then the network will discard the subaddress information.

Only the "user specified" type of subaddress (octet 3 bits 5 to 7) is supported. All other codings of this field received from the calling user will be treated as "user specified". The network will not support the odd/even indicator (octet 3, bit 4) when set to "odd" and will discard any Called party subaddress information element received from the user with the odd/even indicator set to "odd". The coding of the type of subaddress and odd/even indicator in a Called party subaddress information element sent from the network to the called user will be set to "user specified" and "even" respectively.

To ensure correct transport of the called party subaddress information when the called user is connected to the BT ISDN 30 (DASS 2) Service, the subaddress information should consist of IA5 alpha numeric characters excluding "#" (IA5 code for # is hexadecimal 23).

On calls in the reverse direction, a valid Called party subaddress (or NAE on DASS 2) will be conveyed to the ISDN user supported on the *full ETSI call control* network platform without modification.

A.7.19 Terminal Portability (TP)

Reference ETS 300 053 [69], ETS 300 054 [70] and ETS 300 055-1 [71].

In alignment with the standards, this service applies to basic access only configured to operate for S/T-reference point working i.e. in the point-to-multipoint configuration.

Allows a user to move a terminal from one socket to another within one given basic access during the active state of a call. It also allows a user to move a call from one terminal to another within one given basic access during the active state of that call. Suspension of the call has no impact on call charging i.e. call charging continues.

The served user may provide a call identity to the network in order to ensure that the correct call is resumed following call suspension. The maximum length of the call identity is 8 octets. Call identities received exceeding the maximum length will be truncated to 8 octets in accordance with the standards.

Notification to the remote (i.e. non-served) user that a call has been suspended or resumed will be provided. Such notification may not be provided when interworking with other networks - see Table A.5 for details.

Note: in accordance with the standards, whilst the call is suspended, call charging will continue. The call will remain in the suspended state until the served user successfully resumes the call or until the expiry of network timer (currently 3 minutes) clears the call. The network will not prevent both users suspending the call at the same time. It is the user's responsibility to ensure that suspended calls are resumed and subsequently cleared. See also Annex C, Clause C.10.

Whilst the call is suspended, any notifications destined for the served user (e.g. as a result of the remote user successfully invoking Call Suspension or Call Hold) cannot be delivered by the network to the served user and the network will discard these notifications.

A.7.20 Trunk/Line Hunting

This service applies to both basic accesses and primary rate accesses.

This service enables calls to an ISDN number (i.e. the hunt group number) to be offered to an access in a hunt group which contains a free channel. The hunt group can comprise basic accesses or primary rate accesses. All accesses in a hunt group must have the same user configuration. i.e.; S/T or T and be of the same type i.e. basic or primary rate access.

All accesses must be supported on the *full ETSI call control* network platform. Whilst Trunk Hunting is available on ISDN access supported on the *limited ETSI call control* network platform, it is not possible to have a hunt group comprised of access supported on both the *full ETSI* and *limited ETSI call control* network platforms.

Assignment and withdrawal of an access to a hunt group is by administration only i.e. there are no protocols supported to provide the assignment/withdrawal function.

The hunt group can be allocated one directory number. DDI can also be used with Trunk/Line Hunting. Calls will be offered in a sequential manner, i.e. incoming calls will be offered to the first free channel and hunting will start at the same channel in the same access on every occasion. The uniform hunting method of selecting a channel in an access is not supported.

Note: a single "service profile" is provided against all of the directory numbers which are associated with the hunt group of accesses and not individual B-channels.

It is the user's responsibility to ensure compatibility of terminal equipment connected to accesses in a hunt group.

Step-on will occur when the access is busy or no channels are available. Step-on will also occur where the switch has detected access failure. (Step-on will not occur where Layer 1 is operational but the CPE is disconnected.

- End of Annex A -

ANNEX B - RESTRICTIONS APPLICABLE to BT ISDN 2 and ISDN 30 (I.421) SERVICES SUPPORTED ON THE *LIMITED ETSI CALL CONTROL* NETWORK PLATFORM

B.1 Introduction

This annex summarises the principal restrictions applicable to ISDN 2 and ISDN 30 (I.421) services supported on the *limited ETSI call control* network platform which may impact on CPE and which therefore need to be considered when moving CPE from the BT ISDN service supported on the *limited ETSI call control* network platform to the *full ETSI call control* network platform or when designing CPE to operate on either platform.

Details of the restrictions are given in:

ISDN 2 - SIN 171 [28]

ISDN 30 (I.421) - SIN 232 [30] and in particular Annex C of SIN 232.

B.2 Summary Of Principal Restrictions

The principal restrictions relating to the ISDN service supported on the BT *limited ETSI call control* network platform are as follows:

Coding of Bearer Capability (BC) Information Element

Only a limited number of coding points are supported. Other codings of BC if received by the network will either be treated as reserved values or will default to a specific value.

Coding of High Layer Compatibility (HLC) and Low Layer Compatibility (LLC) Information Element

Only a limited number of coding points are supported. HLC and LLC information elements received by the network coded to values not supported are discarded.

Cause Values

Not all Cause information element values as defined in ETS 300 403-1 [12] are supported and some BT specific values are used.

A restricted set of clearing cause values are transferred transparently on clearing from the called user to calling user. All other cause values sent by the called user will be changed to #16 "normal call clearing" before delivery to the calling user.

Diagnostic information is not provided.

Call Progress Information

Call progress indication in association with interworking and with the provision of tones/announcements is not provided.

If the called user sends a PROGRESS message, this message and its contents are discarded and not conveyed to the calling user.

Clearing when tones/announcements are provided

The procedures associated with clearing when tones/announcements are provided are BT specific.

Called Subscriber Held timer

Speech and 3.1 kHz audio bearer capability calls which terminate on the PSTN are subject to a Called Subscriber Held timer (as applied in the PSTN) in the network which prevents first party call clearing. In some circumstances, this can result in calls to a called ISDN user being held up in the call clearing states until the Called Subscriber Held timer expires.

Restart Procedures

The ISDN 30 (I.421) service does not support Restart procedures.

- End of Annex B -

ANNEX C - ADDITIONAL TERMINAL DESIGN GUIDE INFORMATION

C.1 Introduction

This Annex provides information of a general nature which it is hoped will be useful to manufacturers of CPE. It is applicable to both the BT ISDN 2e and ISDN 30e Services except for clause C.8 which applies to ISDN 30e Service only.

C.2 Cause Definitions

Where call clearing is initiated by the network it is recommended that the terminal should make available the clearing cause and cause value received from the network which should be distinguishable from any cause generated by the CPE.

This recommendation is made to allow network provided ISDN call progress information to be correctly interpreted by CPE users and maintenance engineers.

Note: Refer to ETS 300 485 [25] for Cause Codes and Definitions. It should also be noted that in accordance with the standard, CPE should recognise and correctly handle any valid coding of the Location field (including transit network) in Octet 3 of the Cause information element.

C.3 Bypass Numbers

The concept of "bypass" numbers to be connected to an access whose directory numbers are on call forward (divert) to another number does not exist in the international standards. A "bypass" capability can be achieved, however, for:

- access with a single directory number or DDI by using a separate access with its own number(s) connected to the customers CPE.
- ISDN 2e access with MSN by using an additional or other MSN (number).

C.4 Access To Intelligent Network (IN) Services

An increasing number of services are being provided on the BT PSTN using the Intelligent Network architecture. These services could also be available on the ISDN. Some of these services require additional signalling using DTMF (Dual Tone Multi-frequency) signalling. In order for ISDN CPEs to have access to these services, it is recommended that CPE manufacturers provide DTMF capability in their terminal equipment in accordance with I-ETS 300 245-1 [42] Section 5.4.

Note: some Digital Calling Features are supported using the Keypad protocol specified in ETS 300 122-1 [35] (e.g. MCID which is supported using the functional signalling as well as the Keypad protocol signalling - see Clause A.7.14). The Keypad protocol requires the transfer of keypad operations (i.e. a sequence of numeric digits including * and #) via the D-channel in Keypad facility information element. For the support of all services, it is therefore necessary for the terminal equipment to be switchable between sending either DTMF or Keypad facility information elements. It is not recommended that terminal equipment generate both DTMF and Keypad facility information elements at the same time as a result of a single man machine interface interaction.

C.5 Traffic/Channel Management

Accesses may be set-up to be wholly for bothway working, wholly for incoming working or wholly for outgoing working. Specific B-channels in an access can not be so set (the international standards do not specifically support the concept of B-channels which are exclusively for incoming or outgoing use only. However, customer's CPE by using the appropriate B-channel selection procedures when initiating calls and receiving calls (see ETS 300 403-1 [12], sub-clause 5.1.2 and sub-clause 5.2.3.1 respectively) can achieve a similar degree of control. Suppliers are reminded that their equipment must implement the B-channel selection procedures referenced above in order to provide the capability, where required, of using specific B-channels for exclusive outgoing only or incoming only working.

In addition, the CPE can limit the number of incoming calls to be handled at any one time, by rejecting (in accordance with ETS 300 401-2) all incoming call requests which would exceed a pre-set limit.

C.6 Multiple Simultaneous Call Establishment/Automatic Call Generation

It is recommended that for ISDN CPE which needs to establish multiple B-channel connections (e.g. channel aggregator equipment, Routers, etc), a 100 ms gap is placed between successive call establishment requests. This will ensure optimal processing within the network. If no gap is placed between successive call requests, congestion can occur in the network resulting in call establishment failure.

C.7 ISDN Connections Using Satellite Links

CPE designers need to take account that satellite links are used, particularly on international calls, in providing ISDN connections and should take account of the increased delay introduced by the satellite link. Whilst the preferred call routing will try and limit the use of satellite links to one, there are some destinations in the world and under some conditions (e.g. network congestion, fault recovery) where 2 satellite links will be used to provide the ISDN connection. Each satellite link can introduce a one-way transmission delay of 260ms (ref: Recommendation G.114 [3]) and hence applications in ISDN CPE need to be able to tolerate an additional round trip delay of 4*260 = 1.04s.

Guidance on one-way transmission delay can be found in the Recommended Standard for the UK National Transmission Plan for Public Networks, Issue 4 (ND1701:2005/01). This is published by the Network Interoperability Consultative Committee. [5]

C.8 ISDN 30e - Setting Of Sa Bits In Layer 1

CPE designers need to take account of the following clarification to the ETSI layer 1 standard ETS 300 011[9] which is included in Edition 2 of the standard.

It has been identified that there could be a conflict concerning the use of the S_a bits as defined in the “Digital Section Specification (ETS 300 233 [10])" and the "User-Network Interface Specification (ETS 300 011 [9]). In particular it has been identified that if a terminal manufacture sets S_{a5} bit to zero (0), and the network termination equipment (NT1) is transparent to the S_a bits, a condition will be detected by the exchange termination function that an unintentional loopback has been set. This could result in the exchange removing the primary rate access from service. This is to prevent traffic being offered to a looped back access.

On close examination of the respective ETSs it can be found that :-

In ETS 300 233[10] table 2 it is defined that in normal operation the Exchange Termination sends S_{a5} bit set to zero (0), and that in normal operation the DS sends S_{a5} bit set to one(1).

An unintentional loopback condition is S_{a5} bit set to zero(0) detected by the ET.

In ETS 300 011 [9] Table 3 the allocation of bits numbers 1 to 8 of the frame are normative as described in ITU-T Recommendation G.704 [26].

In ITU Recommendation G.704 [26] Table 4a/G.704 - Note 4 iii states "Bits S_{a5} to S_{a7} are for national usage where there is no demand on them for specific point-to-point applications."

"Bits S_{a4} to S_{a8} (where they are not used) should be set to 1 on links crossing an international border."

To overcome the above anomaly ETSI have included the following clarification in Edition 2 of ETS 300 011 [9].

A note has been added to table 2 (Allocation of bits 1 to 8 of the frame) of paragraph 5.5.3 Assignment of bits in timeslot 0.

---

[5] See http://www.nicc.org.uk

NOTE 4: Bits S_{a4} to S_{a8} shall be set to 1 by TEs. S_{a4} and S_{a8} are reserved for international standardisation, S_{a5} to S_{a7} are reserved for national use. TEs shall ignore any received pattern.

C.9 Coding Of Facility Information Element

In ETS 300 102-1 [see footnote to ref. 12], which is effectively an earlier version of ETS 300 403-1 [12], a coding of the Facility information element is given which is a subset of the Basic Encoding Rules as specified in ITU-T Recommendation X.209 [27] used in ETS 300 196-1 [34]. ETS 300 102-1 specifies only the definite (short) form of the Basic Encoding Rules whereas ETS 300 196-1 [34] allows the full Basic Encoding Rules (i.e. definite (short), definite (long) and indefinite forms).

The BT ISDN will generate and expect to receive the Facility information element coded as specified in ETS 300 196-1 [34].

C.10 Call Hold and Terminal Portability

In accordance with the international standards, the network will not prevent:

- both calling and called users from suspending the call at the same time (in association with the Terminal Portability Digital Calling Feature), or
- both calling and called users putting the call on hold at the same time (in association with Call Hold Digital Calling Feature) or
- one user suspending the call and the other user putting the call on hold at the same time.

Call charging will continue whilst a call is in the held or suspended state. Whilst the network monitors the suspended state (see Cause A.7.19), the network cannot monitor held calls. It is the user's responsibility to ensure that held or suspended calls are eventually cleared. It is therefore recommended that terminal equipment is designed such that it makes the user very aware of the presence of any held or suspended calls.

C.11 CPE Configuration Affecting Call Charges

The configuration of CPE, particularly those using automatic call generation, can significantly impact on customer's bills. It is important that the configuration is optimised for the customer's application and that the users are made aware of the importance of maintaining the configuration for optimal performance and costs. If equipment is incorrectly configured the customer may receive unnecessary call charges. This incorrect configuration has shown itself in the following forms:

C.11.1 Long Duration Calls

It has been identified that some calls may not be cleared correctly by the user or may not be cleared due to mis-configuration of the terminal equipment. This results in long duration calls and higher than expected call charges. For example:

- Connections may be maintained during idle periods for Remote LAN access
- ISDN used as a private circuit back up has routers that fail to release the call when the private circuit is restored.
- Customer may end a Video Conferencing call by turning off the monitor but actually, unintentionally leave the call connected.

It is recommended that CPE customers should be made aware of the importance of ensuring that their CPE, particularly some Videoconferencing equipment, Bridges and Routers etc have been configured to clear down correctly at the end of a call.

C.11.2 Short Duration Calls (Automatic Call Generation)

It has been identified that some terminal equipment automatically makes calls using the B channels without the user's knowledge. Correct configuration of the terminal equipment can minimise the amount of automatic call generation. Some terminal equipment can be configured to make calls on a transactional basis instead of utilising the full minimum charging period. This may not be the most efficient way to configure the application and the customer could be better off by keeping the call "open" (toll saving) for the duration of the minimum call fee making better use of the time paid for.

For example:

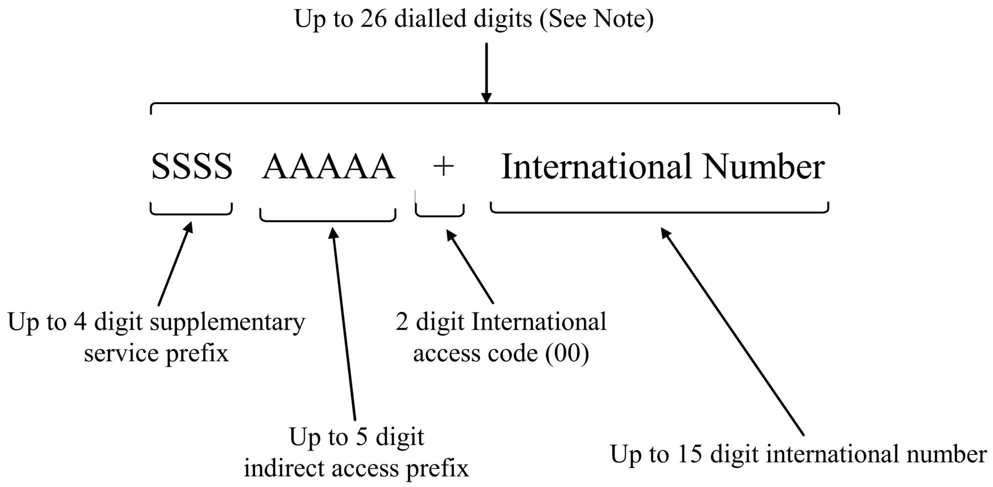
- Calls made for each individual e-mail sent, instead of batching a number of e-mails together and making one call.
- Routers sending protocol "watchdog" packets in the background
- Maximum call length timers incorrectly set too short

It is recommended that terminal equipment customers are advised on the optimum configuration of their equipment and the correct call clearing method so as to minimise call charges.

C.12 CPE Compliance With International Standards

CPE manufacturers are reminded that full compliance to the relevant international standards is fundamental for correct operation of systems. This SIN (and particularly Annex A) provides guidance on the required international standards to be followed for interoperability with the BT network. It should be noted the standards define a valid range and tolerances for the various parameters, particularly for the electrical characteristics specified in the layer 1 standard. It is essential that for CPE to correctly interface with the BT network, then it must also fully conform to these standards i.e. the CPE must work correctly throughout the whole valid range of a given parameter.

C.13 Called Party Number Information Field[6]


Up to 26 dialled digits (See Note)
SSSS AAAAA + International Number
Up to 4 digit supplementary service prefix
2 digit International access code (00)
Up to 5 digit indirect access prefix
Up to 15 digit international number

Note. Only the dialled digits applicable to the public switched networks are shown. Additional digits may be required in private networks e.g. the use of a prefix digit(s) to gain access from the private network/PBX to the public network.

Figure C.1 – Structure and length of dialled digits for public switched networks

The dialled digits defined in Figure C.1 will usually form the Number Digit field of the Called party number information element (see first bullet point below for other possible alternatives). The number digit field has a maximum length of 20 numbers (IA5 characters).

In accordance with the ETSI standards, the following points should be noted when encoding the Called party number information field (note: in the following cases, the Numbering plan field of the Called party number information element shall be coded 'ISDN/telephony numbering plan'):

- The Digital Calling Feature prefix may, depending on its meaning, be mapped onto DSS1 information elements relating to that Digital Calling Feature. For example, the Digital Calling Feature prefix 141 results in exactly the same action as invoking Calling Line Identity Restriction using the appropriate coding of the "presentation indicator" in the Calling party number information element - see Clause A.7.9. Hence CPE could interpret the 141 prefix, map it into the appropriate coding of the "presentation indicator" in the Calling party number information element and remove the 141 from the dialled digit string.

---

[6] The information in this clause was first published in SIN 277. SIN 277 has been withdrawn and the information is now published here.

- When the international number is preceded with a prefix (Digital Calling Feature or indirect access prefix), the coding of the Type of number in the Called party number information element shall be set to Unknown and the Number digits includes the prefixes, international access code (00) and international number.
- If there are no prefix digits (Digital Calling Feature or indirect access) then the Called party number information element can be coded using either of the options in Table C.1.

	Coding of Fields in Called party number information element	
	Type of number	**Number digits**
Option 1	Unknown	International access code (00) plus international number
Option 2	International number	International number **excluding** international access code (00)

Table C.1 - Coding of Called party number information element for an international number

In the case where the length of the Number digit field would exceed 20 octets, then overlap sending procedures must be used.

C.14 Progress Indicator Information Element 'Location' code point '03' (Transit Network)

Calls to/from certain Analogue network destinations can cause the network to send a progress indicator with a location code point of ‘03’ (Transit Network). The code point 03, although defined in ETS 300 403 is a reserved value in ETS 300 102.

CPE should support Progress Indicator information elements with a ‘Location’ code point of 03. This can be received from the network either in an incoming ‘SETUP’ message or in a ‘PROGRESS/ALERTING’ message for outgoing calls.

C.15 Sub-Equipped Circuits

Where a sub-equipped circuit is provided, only specific channels will be available for use. This will typically be channels 1 to n, where n is the number of channels provided.

In accordance with international standards, it is therefore recommended that CPE leaves B-channel selection to the network to perform.

C.16 Voice Calls - Network Tones & Announcements

When a voice call, originated from a circuit provided on the full ETSI call control platform fails, the BT ISDN Service sends a ‘DISCONNECT’ message, including a ‘Cause’ and ‘Progress Indicator’ information element, to the calling user. CPE should ensure that any network tones or announcements are passed through to the user (see ETS 300 102-1 section 5.3.4.1).

C.17 Forwarded Calls CFU, CFNR, CFB & CD - Receipt Of Additional Layer 3 Messages and Information Elements

Where a call has been subjected to network call forwarding, all parties involved in the call may receive information about the history of the call. This information can be contained in 'Notification Indicator', 'Redirecting Number', 'Redirection Number' and 'Facility' information elements. CPE suppliers need to ensure that their equipment is compatible with the receipt of this information.

C.18 Telephony 7 kHz and Videotelephony

From September 2001, the BT network ceased to support the fallback procedure defined in the ETSI standards [13, 14] for telephony 7 kHz and videotelephony. If a calling user signals to the network using the procedures defined in ETS 300 267-1 [15] that fallback is allowed, the network may not provide the correct bearer capability for the resultant call. Hence it is recommended that users do not use the fallback procedure and adopt a multiple call attempt strategy ie initially make a call request for the preferred teleservice with fallback not allowed and if this first call attempt fails, tries a second call attempt requesting an alternative teleservice (eg telephony 3.1 kHz).

ETS 300 267-1 [15] specifies that when requesting a telephony 7 kHz or videotelephony call with fallback not allowed, the Bearer capability information element should be set to "unrestricted digital information with tones/announcements". This bearer capability is only supported on the *full ETSI call control platform* (ie on calls between ISDN 2e and ISDN 30e users). Calls with this bearer capability will fail if interworking is encountered with ISDN 2, ISDN 30 (I.421), and ISDN 30 (DASS). ETS 300 267-1 points out that "the user may obtain an equivalent service, possibly without tones and announcements, by requesting a circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category. In order for this alternative service mechanism to operate, the destination user will also have to support the reception of calls using the circuit-mode 64 kbit/s unrestricted 8 kHz structured bearer service category." The use of a 64 kbit/s bearer capability is supported on both the *limited ETSI call control platform* (ie ISDN 2, ISDN 30 (I.421) and ISDN 30 (DASS)) and *full ETSI call control platform* (ie ISDN 2e and ISDN 30e).

- End of Annex C -

ANNEX D - DIFFERENCES COMPARED TO PREVIOUS ISSUE OF SIN 261

This document provides a *brief* description of the *major* changes between this issue of Suppliers Information Note 261 and the previous issue. Please refer to the main body of the document for full descriptions of each topic, particularly as a number of editorial changes have also been made throughout this issue of the document.

DESCRIPTION	REF. SECTION
Announcement of programme to provide increased transparency of capabilities on international calls	Sections A.2 & A.7
Editorial changes (e.g. replacement of “care” levels with non BT line of business generic names, re-branding of Digital Select Services as Digital Calling Features)	Throughout the whole document.

Table D.1 - List of major changes from previous issue of SIN 261

- End of Annex D -